VINAYAKA MISSION'S RESEARCH FOUNDATION

(DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF THE UGC ACT 1956)

FACULTY OF ARTS AND SCIENCE

(Declared under Section 3 of the UGC Act 1956)

BACHELOR OF COMPUTER SCIENCE

BOS-2019

SCIENCE BOARD - 2019

REGULATIONS 2019

FACULTY OF ARTS AND SCIENCE

B.Sc. -COMPUTER SCIENCE PROGRAMME OUTCOMES

B. Sc Computer Science Programme has been designed to prepare graduates for attaining the following outcomes:

- An ability to apply a wide knowledge of Computing, Mathematics, Environmental knowledge applicable to the discipline.
- An ability to design, implements and appraise a computational system to bump into desired needs within realistic constraints.
- An ability to identify articulates and develop solutions to perform computational challenges.
- An ability to perform real time applications training through the project work.
- An ability to function efficiently on teams to achieve shared computing design, evaluation, or implementation goals.
- An ability to meet the current job market by equipping with Communication ability skills.
- An understanding of professional, ethical, legal, security and social issues and responsibilities for the computing profession.
- An ability to analyse impacts of computing on individuals, organizations, and society.
- Recognition of the need for and ability to engage in continuing professional development.
- An ability to use appropriate techniques, skills, and tools necessary for computing practice.
- An ability to spread over mathematical foundations, algorithmic principles, and computer science theory in the modelling and design of computational systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

FACULTY OF ARTS AND SCIENCE

FACULTY OF ARTS & SCIENCE
BOARD OF STUDIES 2019 / BOARD OF SCIENCE
REGULATION – 2019
Bachelor of Computer Science (B.Sc Computer Science) - Regular
CURRICULUM (CBCS – Choice Based Credit System)

OVERALL CREDITS

S. No.	Nature of Course	No. of Courses	Credit / Each course	Total No. of Credits
I	**CORE COURSES**			
	DSC – 1 : Discipline Specific Core Courses – 1	4	6	24
	DSC – 2 : Discipline Specific Core Courses – 2	4	6	24
	DSC – 3 : Discipline Specific Core Courses – 3 (Foundation Courses)	8	3	24
II	**ELECTIVE COURSES**			
	DSE -1: Discipline Specific Elective-I	2	6	12
	DSE-2: Discipline Specific Elective-II:	2	6	12
	DSE-3: Discipline Specific Elective-III (including Project Work/Dissertation)	2	6	12
III	**ABILITY ENHANCEMENT COURSES**			
	AECC-1:Ability Enhancement Compulsory courses-1 (Environmental Science)	1	4	4
	AECC-2:Ability Enhancement Compulsory courses-2(English Communication Lab/ Basic Tamil)	1	4	4
	SKILL ENHANCEMENT COURSES			
	SEC : Skill Enhancement courses	4	4	16
IV	**VALUE ADDED COURSES**			
	VAC : Value Added Courses	1	2	2
	Swayam *	1	2	-
	NSS/RRC/Sports Activity *	1	2	-
	Total Credits			**134**

***Non – CGPA Courses**

*Swayam /NSS/RRC/Sports Activity Based on performance and attendance, which will not be calculated for CGPA

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I - CORE COURSE

DSC – 1: Discipline Specific Core Courses – 1

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	TOTAL CREDITS
1.	DSC – 1A	Basics of Computer and Python	4	24
		Basic Python Programming Lab	2	
2.	DSC – 1B	Programming in C	4	
		Programming in C Lab	2	
3.	DSC – 1C	Object Oriented Programming using C++	4	
		Object Oriented Programming using C++ Lab	2	
4.	DSC – 1D	Fundamentals of Data Structure	4	
		Fundamentals of Data Structure Lab	2	

DSC – 2: Discipline Specific Core Courses – 2

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	TOTAL CREDITS
1.	DSC – 2A	Digital Electronics and Microprocessor	4	24
		Digital Electronics and Microprocessor Lab	2	
2.	DSC – 2B	Database Management Systems	4	
		Database Management Systems Lab	2	
3.	DSC – 2C	Programming in JAVA	4	
		Programming in JAVA Lab	2	
4.	DSC – 2D	Operating System	4	
		Operating System Lab	2	

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DSC – 3: Discipline Specific Core Courses – 3 (Foundation Courses)

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	TOTAL CREDIT
5.	DSC – 3A1	**Tamil - I / Hindi – I / French - I**	3	24
6.	DSC – 3A2	**Tamil - II / Hindi – II / French - II**	3	
7.	DSC – 3A3	**Tamil - III / Hindi – III / French - III**	3	
8.	DSC – 3A4	**Tamil - IV/ Hindi – IV / French - IV**	3	
9.	DSC – 3B1	**English I**	3	
10.	DSC – 3B2	**English II**	3	
11.	DSC – 3B3	**English III**	3	
12.	DSC – 3B4	**English IV**	3	

II - ELECTIVE COURSE

a) DSE – 1 DISCIPLINE SPECIFIC ELECTIVE COURSE - 6 Credits each (2 courses x 6 credits = 12 credits)

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	TOTAL CREDIT
1	DSE – 1A	Numerical and Statistical Methods	6	12
2		Differential and Integral Calculus	6	
3	DSE – 1B	Operations Research	6	
4		Discrete Mathematics	6	

b) DSE – 2 DISCIPLINE SPECIFIC ELECTIVE COURSE- 6 Credits each (2 courses x 6 credits = 12 credits)

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	TOTAL CREDIT
1	DSE – 2A	Applied Physics I	6	

2		Applied Physics II	6	12
3	DSE – 2B	Applied Physics III	6	
4		Applied Physics IV	6	

c) DSE – 3 DISCIPLINE SPECIFIC ELECTIVE- 6 Credits each (2 courses x 6 credits = 12 credits)

S.NO	COMPONENT CODE	SUBJECT TITLE	CREDIT	
1	DSE – 3A	Software Engineering	4+2	
2		Data Mining	4+2	**12**
3		Building Internet of Things	4+2	
4		Cloud Computing	4+2	
5	DSE – 3B	Project Work - Dissertation – **Compulsory**	6	

III - ABILITY ENHANCEMENT COURSE

S No	COMPONENT CODE	1. Ability Enhancement Compulsory Course	Credits	Total
1	AECC - 1	Environmental Science	4	**4 x 2= 8**
2	AECC - 2	English Communication – Lab / Basic Tamil	4	
S No	**COMPONENT CODE**	**2. Skill Enhancement Course (Any Four)**	**Credits**	**Total**
1	SEC - 1	Yoga and Meditation – Lab	4	**4 x 4 = 16**
2	SEC – 2	Soft Skills Lab – I	4	
3	SEC - 3	Soft Skills Lab – II	4	
4	SEC - 4	PHP Programming	4	
5		Programming in SCILAB	4	

6		R Programming	4	

IV - VALUE ADDED COURSE (ANY ONE)

No	COMPONENT CODE	IV - Value Added Course (Any One)	Credits	Total
1	VAC	Women Studies	2	**1 x 2 = 2**
		Indian Constitution – Configurable Structure	2	
		Basic Life Support and First Aid (Demonstration)	2	
		Fire Safety (Demonstration)	2	
		Industrial Safety	2	

NOTE:

*** If the candidate from other states they can learn the basic Tamil subject instead of English Communication.**

**** If the candidate select the Basic Life Support and First Aid (Demonstration) & Fire Safety (Demonstration) as their value added programme, the certificate obtained by candidate should be submitted to the COE to provide required 2 credits**.

FACULTY OF ARTS AND SCIENCE

Bachelor of Computer Science

Curriculum - 2019 (Choice Based Credit System)

CURRICULUM - 2019

S.No	Component Code	Paper Title	Theory / Practical	Credit	Semester Credits
FIRST SEMESTER					
1	DSC – 3A1	Tamil – I / Hindi – I / French – I	Theory	3	22
2	DSC – 3B1	English – I	Theory	3	
3	DSC - 1A	Basics of Computer and Python	Theory	4	
4	DSC - 1A	Basic Python Programming Lab	Practical	2	
5	DSE - 1A	Discipline Specific Elective Course - I	Theory / Practical / Both	6	
6	AECC - 1	Environmental Science	Theory	4	
SECOND SEMESTER					
1	DSC – 3A2	Tamil – II / Hindi – II / French – II	Theory	3	22
2	DSC – 3B2	English – II	Theory	3	
3	DSC- 1B	Programming in C	Theory	4	
4	DSC – 1B	Programming in C Lab	Practical	2	
5	DSE – 2A	Discipline Specific Elective Course - II	Theory / Practical / Both	6	
6	SEC – 1	Yoga & Meditation Practical	Practical	4	

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S.No	Component Code	Paper Title	Theory / Practical	Credit	Semester Credits
THIRD SEMESTER					
1	DSC – 3A3	Tamil – III / Hindi – III / French – III	Theory	3	22
2	DSC – 3B3	English – III	Theory	3	
3	DSC- 1C	Object Oriented Programming using C++	Theory	4	
4	DSC – 1C	Object Oriented Programming using C++ Lab	Practical	2	
5	DSC- 1D	Fundamentals of Data Structure	Theory	4	
	DSC- 1D	Fundamentals of Data Structure Lab	Practical	2	
6	AECC - 2	English Communication / Basic Tamil	Theory / Practical	4	
FOURTH SEMESTER					
1	DSC – 3A4	Tamil – IV / Hindi – IV / French – IV	Theory	3	24
2	DSC – 3B4	English – IV	Theory	3	
3	DSC- 2A	Digital Electronics and Microprocessor	Theory	4	
4	DSC – 2A	Digital Electronics and Microprocessor Lab	Practical	2	
5	DSE – 2B	Discipline Specific Elective Course - III	Theory / Practical / Both	6	
7	SEC – 2	Soft Skill – I	Practical	4	
8	VAC	Value Added Course	Theory	2	

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S.No	Component Code	Paper Title	Theory / Practical	Credit	Semester Credits
FIFTH SEMESTER					
1	DSC- 2B	Database Management Systems	Theory	4	22
2	DSC–2B	Database Management Systems Lab	Practical	2	
3	DSC- 2C	Programming in JAVA	Theory	4	
4	DSC–2C	Programming in JAVA Lab	Practical	2	
5	DSE-1B	Discipline Specific Elective Course - IV	Theory / Practical / Both	6	
6	SEC – 3	Soft Skill – II	Practical	4	
SIXTH SEMESTER					
1	DSC- 2D	Operating System	Theory	4	22
2	DSC–2D	Operating System Lab	Practical	2	
3	SEC – 4	Skill Enhancement Course - IV	Theory / Practical	4	
4	DSE - 3A	Discipline Specific Elective Course - V	Theory / Practical / Both	6	
5	DSE – 3B	Project Work / Dissertation	Project	6	

Total Credits: 134

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1A	**Subject Code :**U19CSC1BP
Subject Title : BASICS OF COMPUTER AND PYTHON	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	1. To review the ideas of computer science, programming, and problem-solving. 2. To understand abstraction and the role it plays in the problem-solving process. 3. To understand and implement the notion of an abstract data type. 4. To review the Python programming language.

Outcomes :	Students can be able to get : 1. The ideas of computer science, programming, and problem-solving. 2. Thorough knowledge in basics of Python Programming

L	**T**	**P**	**C**
4	**0**	**0**	**4**

UNIT I: **12 Hours**

Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers, Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, I/O devices, Logic Gate, Number system

UNIT II: **12 Hours**

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Flowcharting, algorithms, structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

UNIT III: **12 Hours**

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell,Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator,

Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

UNIT IV: **12 Hours**

Creating Python Programs: Input and Output Statements, Control statements (Looping-while Loop, for Loop, Loop Control, Conditional Statement- if...else, Difference between break, continue and pass).

UNIT V: **12 Hours**

Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.

TEXT BOOKS :

1. P. K. Sinha &PritiSinha, "Computer Fundamentals", BPB Publications, 2007.
2. T. Budd, Exploring Python, TMH, 1st Ed, 2011

REFERENCE BOOKS:

1. P. K. Sinha &PritiSinha, "Computer Fundamentals", BPB Publications, 2007.
2. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
3. Python Tutorial/Documentation www.python.or2010
4. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : Learning with Python , Freely available online.2012
5. http://docs.python.org/3/tutorial/index.html
6. http://interactivepython.org/courselib/static/pythonds
7. http://www.ibiblio.org/g2swap/byteofpython/read/

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1A	**Subject Code :**U19CSC1BL
Subject Title : Basic Python Programming Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

Section: A (Simple programs)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice Versa depending upon user's choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
   Grade A: Percentage >=80
   Grade B: Percentage>=70 and <80
   Grade C: Percentage>=60 and <70
   Grade D: Percentage>=40 and <60
   Grade E: Percentage<40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - n/n!
7. WAP to calculate the sum and product of two compatible matrices.
8. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula m=60/(t+2), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.
9. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:

$P(t) = (15000(1+t))/(15+ e)$

   where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.

10. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
    I. velocity wrt time (v=u+at)
    II. distance wrt time (s=u*t+0.5*a*t*t)
    III. distance wrt velocity (s=(v*v-u*u)/2*a)

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1B	Subject code :U19CSC2PC
Subject Title : Programming in C	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	1. To acquire basic knowledge about Programming in C 2. To gather extensive knowledge in C programming and developing programming skills 3. To strengthen the knowledge on structures, arrays etc., of C programming

Outcomes :	On the completion of the course, the students will be able to: 1. Understand the fundamentals of C programming. 2. 2Choose the loops and decision making statements to solve the problem. 3. Implement different Operations on arrays. 4. Use functions to solve the given problem. 5. Understand pointers, structures and unions. 6. Implement file Operations in C programming for a given application.

L	**T**	**P**	**C**
4	**0**	**0**	**4**

UNIT I - OVERVIEW OF C **12 Hours**

Introduction- Importance of C- Basic Structure of C program- Tokens-Variables- Data types-Operators and Expression- Managing Input and Output Operators.

UNIT II - CONDITIONAL STATEMENTS **12 Hours**

If statement- switch statement- goto statement- while statement- do statement-for statement-continue statement- break statement.

UNIT III - ARRAYS AND FUNCTIONS **12 Hours**

One dimensional array- Two dimensional array- Multidimensional array-Built in functions (Library functions): String Handling functions-User defined functions.

UNIT IV - STRUCTURES, UNIONS AND POINTERS **12 Hours**

Structure definition-Arrays of structures- Structures and functions-Unions-Understanding pointers- Declaring and initializing pointers- Pointers and arrays-Pointers and functions- Pointers and structures.

UNIT V - FILE MANAGEMENT **12 Hours**

Defining and Opening a file- Closing a file- Input output operations on files-Error Handling during I/O operations- Command line arguments.

TEXT BOOK

1. Balagurusamy.E (2008), *"Programming in ANSI C"* , Second Edition, Tata McGraw Hill.

REFERENCES

1. KamthaneAshok.N (2013), *"Programming in C"*, 2nd Edition, Pearson Education.
2. Yashvant P. Kanetkar (2008*), "Let us C",* 8th Edition, Infinity science press.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1B	**Subject Code :**U19CSC2PL
Subject Title : Programming in C Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

1. Program to check whether a number is positive or negative or zero using if statement.
2. Program to check vowel or consonant using switch case statement.
3. Program to check whether a number is prime or not using while statement.
4. Program to generate multiplication table using do…while statement.
5. Program to check the given string is palindrome or not using for statement.
6. Program to display Fibonacci series.
7. Program to search an element in an array using linear search method.
8. Program to find the smallest and largest number among ‘n’ numbers.
9. Program to sort elements in an array.
10. Program to add two matrices.
11. Program for manipulating the strings using string handling functions.
12. Program to find the sum of ‘n’ numbers by user-defined function.
13. Program to calculate factorial of a number using recursion.
14. Program to generate the mark sheet of the student using structure.
15. Program to copy the content of one file to other file.

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BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1C	**Subject Code :**U19CSC3OP
Subject Title : Object Oriented Programming Using C++	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	1. To learn the concepts of class & objects. 2. To perform Inheritance, Overloading of operators, functions and constructors

Outcomes :	After the completion of this course, a successful student will be able to do the following: 1. Use the characteristics of an object-oriented programming language in a program. 2. Use the basic object-oriented design principles in computer problem solving. 3. Program with advanced features of the C++ programming language.

L	**T**	**P**	**C**
4	**0**	**0**	**4**

UNIT I - PRINCIPLES OF OBJECT ORIENTED PROGRAMMING 12 Hours

Object Oriented Programming Paradigms- basic concept of OOPS- benefits of OOP-what is C++-simple C++ program-structure of C++ program- creating a source file – compiling and linking.

UNIT II - TOKENS, EXPRESSION AND CONTROL STRUCTURES 12 Hours

Tokens-keywords-identifiers and constants-basic data types-user defined data types-derived data types-type compatibility-declaration of variables-dynamic initialization of variables-reference variables-operators in C++-manipulators-type cast operator-implicit conversion-operator overloading-control structures.

UNIT III - CLASS AND OBJECTS 12 Hours

Functions in C++- function overloading-Specifying a class- defining member function-arrays within a class-arrays of objects- objects as function arguments- friendly functions-constructor and destructor

UNIT IV - INHERITANCE, POINTER, VIRTUAL FUNCTION AND POLYMORPHISM **12 Hours**

Single inheritance-multilevel-multiple inheritance-hierarchical-hybrid-virtual base class-abstract classes-pointers-this pointer-virtual functions-pure virtual functions.-operator over loading- rules for operator overloading

UNIT V - MANAGING CONSOLE I/O OPERATIONS **12 Hours**

C++ streams- streams classes-unformatted I/O operations-formatted console I/O operations-managing output with manipulators- exception handling- basics of exception handling.

TEXT BOOK

1. Balagurusamy.E (2008), "Object Oriented Programming with C++", TataMcGraw-Hill Publication.

REFERENCE

1. Herbert Schildt (2003), "C++: The Complete Reference", Tata McGraw publication.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1C	**Subject Code :**U19CSC3OL
Subject Title : Object Oriented Programming Using C++ Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. Write a C++ program to implement the concept of constructors and Destructors.

2. Write a C++ program to calculate simple interest and compound interest using class and objects

3. Write a C++ program to calculate volume of sphere , cube and rectangle using function overloading

4. Write a C++ program to Calculate the area of triangle and rectangle using single inheritance

5. Write a C++ program to implement the concept Arrays of Objects in the following problem:
   a. Create Class 'student', create an array of students, find out the student who got the first rank

6. Write a C++ program to implement operator overloading to perform complex arithmetic

7. Write a C++ program to implement the concept of Inheritance
   a. Create a class 'College', create another class 'department' by using 'college' as a base class, and verify the functions in the derived and base classes. Also to verify by keeping the two functions with same name (one in the base class and another in derived class)

8. Write a C++ program to handle the error using Exception Handling..

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BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1D	**Subject Code :**U19CSC4DS
Subject Title : Fundamentals of Data Structures	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	1. To learn Several data structure concepts like stack, queue, linked list, trees and graphs 2. To learn the Applications of data structures. 3. To improve the Problem solving quality using data structure techniques.

Outcomes :	On the completion of the course, the students will be able to: 1. Ability to analyze algorithms and a algorithm correctness. 2. Ability to summarize searching and sorting techniques 3. Ability to describe stack,queue and linked list operation. 4. Ability to have knowledge of tree and graphs concepts.

L	**T**	**P**	**C**
4	**0**	**0**	**4**

UNIT I - INTRODUCTION TO DATA STRUCTURES **12 Hours**

Definition – types of data structure-abstract data type-array as an abstract data type-representation of array- sparse matrices- asymptotic notation.

UNIT II - STACKS AND QUEUES **12 Hours**

Stacks- queue- mazing problem- evaluation of expression- postfixes notation- infix to post fix- multiple stack and queue.

UNIT III - LINKED LIST **12 Hours**

Singly linked list- representation of linked singly list- operations on singly linked list-doubly linked list- representation of doubly linked list- operations on doubly linked list-differentiate singly and doubly linked list- circularly singly and doubly linked list

UNIT IV - TREES **12 Hours** Tree

Terminology- representation of tree- binary tree- binary tree traversal-operations on tree- applications- Sorting : selection sort- bubble sort- quick sort

UNIT V - GRAPHS **12 Hours**

Definition- representation of a graph- operations- breadth first search- depth first search- minimum cost spanning trees- kruskal's algorithm and prim's algorithm-shortest path and transitive closure- single source- floyds algorithm- all pair dijikstra's algorithm.

TEXT BOOK

1. Ellis Horowitz, Sahni, Dinesh Mehta (1999), "Fundamentals of Data Structures in C++", Golgotha publication, New Delhi.

REFERENCE

1. Weiss Mark Allen (2006), "Data Structure and algorithm analysis", Pearson Education.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-1D	**Subject Code :**U19CSC4DL
Subject Title : Fundamentals of Data Structures Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 60**

L	T	P	C
0	0	4	2

1. Write a program to search an item in the list using (i) Linear Search (ii) Binary Search
2. Implement PUSH, POP operations of stack using Arrays.
3. Implement add, delete operations of a queue using Arrays.
4. Conversion of infix to postfix using stacks operations.
5. Write a program to evaluate arithmetic expression using stack
6. Perform Addition of two polynomials using singly linked list
7. Solve the single source shortest path problem. (Note: Use Dijkstra's algorithm).
8. Traverse a binary tree in: a) Pre-order b) In-order c) Post-order
9. Sorting a given list of elements in ascending order using the following sorting methods:

   a) Quick sort b) Merge sort.
10. Perform the following operations in a given graph (i) Depth first search (ii) Breadth first search
11. Perform selection and bubble sort for the given set of elements.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2A	**Subject Code :**U19CSC5MP
Subject Title : Digital Electronics and Microprocessor	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	1. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits 2. To understand basic architecture of 16 bit and 32 bit microprocessors. 3. To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design. 4. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.

Outcomes :	After the completion of this course, a successful student will be able to do the following: 1. Design and implement Combinational circuits. 2. Design and implement synchronous and asynchronous sequential circuits 3. perform experiments on assembly language programming 4. analyze the data transfer information through serial & parallel ports.

L	**T**	**P**	**C**
4	**0**	**0**	**4**

UNIT I **12 Hours**

Binary Systems & Code conversion,BooleanAlgebra & Logic Gates –Truth Tables –Universal Gates –Simplification of Boolean functions: SOP, POS methods –K-map, –Combinational Logic: Adders &Subtractors –Multiplexer –Demultiplexer -Encoder –Decoder.

UNIT II **12 Hours**

Sequential Logic: RS, ClockedRS, D, JK, Master Slave JK, T Flip-Flops –Shift Registers –Types of Shift Registers –Counters: Ripple Counter –Synchronous Counters –Up-Down Counter.

UNIT III **12 Hours**

Introduction to Microprocessor – Evolution of microprocessor – general architecture of microprocessor system – architecture of 8085 A – pin configuration– machine language and

assembly language. The 8085 instruction set - Instruction classification – instruction and data format – addressing modes – instruction set of 8085 – data transfer operations, arithmetic operations, logic operations, Stack operations, I/O operations and machine control operations – programming techniques such as looping counting and indexing.

UNIT IV **12 Hours**

Programming a Microprocessor – Program writing for 8-bitaddition, subtraction, multiplication and division – 16 bit addition, subtraction, multiplication – BCD addition and subtraction – BCD to binary and binary to BCD conversion – octal to binary conversion – ASCII to BCD and BCD to ASCII conversions – ASCII to binary and binary to ASCII conversions – biggest and smallest – sorting and searching – block data transfer.

UNIT V **12 Hours**

Counters and time delays – Time delay using single register and register pair hexadecimal counter. Timing sequences – opcode fetch cycle – memory read cycle – memory write cycle – I/O read cycle – I/O write cycle. Data transfer methods - Memory organization – memory mapping – I/O mapping

TEXT BOOKS:

1. M. Morris Mano,2005, Digital Logic and Computer Design, Prentice-Hall of India Pvt. Ltd.
2. Introduction to Microprocessor – A.P. Mathur, TMH-2007

REFERNECE BOOKS:

1. D. P. Leach and A. P. Malvino,2002,Digital Principles and Applications,5thEdition, Tata McGraw, Hill Publishing Co. Ltd.
2. Microprocessor Architecture, Programming and applications with 8085 / 8085 A' – R.S.GAONKAR, Wiley Eastern Limited

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2A	**Subject Code :**U19CSC5ML
Subject Title : Digital Electronics and Microprocessor Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

I. DIGITAL ELECTRONICS:

1.Verification of Truth Table for AND, OR, NOT, NAND, NOR and EX-OR gates.
2.Realisationof NOT, AND, OR, EX-OR gates with only NAND and only NOR gates.
3.Verification of DeMorgan's Law.
4.Implementation of Half-Adder and Half-Subtractor.
5.Implementation of Full-Adder and Full-Subtractor.

II: MICROPROCESSOR:

1. 8-bit addition and subtraction
2. 16 - bit addition and subtraction.
3. BCD addition and subtraction.
4. 8 - bit multiplication and division.
5. Searching for an element in an array.
6. Sorting in Ascending order.
7. Finding largest and smallest elements from an array.
8. Sorting in descending order.
9. BCD to Hex and Hex to BCD.
10. Binary to ASCII and ASCII to Binary.

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BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2B	**Subject Code :**U19CSC6DB
Subject Title : Database Management Systems	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	To understand basic database concepts, including the structure and operation of the relational data model.

Outcomes :	At the end of the course, the students will be able to : 1. Master the basics of SQL and construct queries using SQL. 2. Mater sound design principles for logical design of databases, including the E-R method and normalization approach

L	T	P	C
4	0	0	4

UNIT I: **12 Hours**

Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT II: **12 Hours**

Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL: Schema Definition, constraints, and object modeling.

UNIT III: **12 Hours**

Relational Data Model: Basic concepts, relational constraints, relational algebra, SQL queries.

UNIT IV: **12 Hours**

Database design: ER and EER to relational mapping, functional dependencies, normal forms up to third normal form.

UNIT V: **12 Hours**

Transaction Management and Concurrency Control: Transaction, Properties of Transactions, States of Transaction, Concurrency Control, Concurrency Control Schemes, SQL Commands for Transaction-BEGIN-COMMIT-ROLLBACK-SAVE-IN Commands.

Text Book:

1. Database Management Systems, Fifth edition, Alexis Leon, Mathews Leon, McGraw-Hill-2005.

Reference Books:

1. Database System Concepts, Abraham Silberschatz, Henry F.Korth, S.Sudharshan, McGraw-Hill-2006, 5th Edition.
2. "An introduction to database systems", Bipin C. Desai, Galgotia Publications Pvt. Ltd., 1991.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2B	**Subject Code :**UG19CSC6DL
Subject Title : Database Management Systems Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

Note: Ms-Access/MySQL may be used.

The following concepts must be introduced to the students:

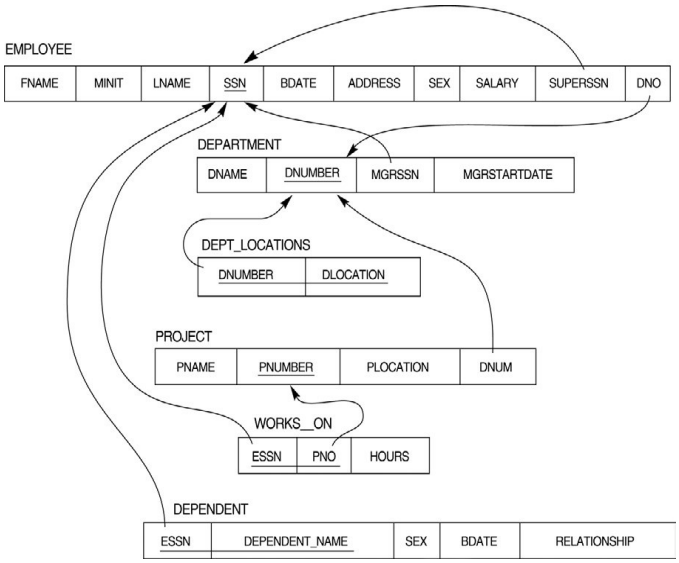
DDL Commands

- Create table, alter table, drop table

DML Commands

- Select , update, delete, insert statements
- Condition specification using Boolean and comparison operators (and, or, not,=,<>,>,<,>=,<=)
- Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max)
- Multiple table queries (join on different and same tables)
- Nested select statements
- Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
- Categorization using group by……..having
- Arranging using order by

Relational Database Schema - COMPANY



Questions to be performed on above schema

I. Create tables with relevant foreign key constraints
II. Populate the tables with data
III. Perform the following queries on the database :

1. Display all the details of all employees working in the company.
2. Display ssn, lname, fname, address of employees who work in department no 7.
3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
4. Retrieve the name and salary of every employee
5. Retrieve all distinct salary values
6. Retrieve all employee names whose address is in ‘Bellaire’
7. Retrieve all employees who were born during the 1950s
8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
9. Retrieve the names of all employees who do not have supervisors
10. Retrieve SSN and department name for all employees
11. Retrieve the name and address of all employees who work for the 'Research' department
12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
14. Retrieve all combinations of Employee Name and Department Name
15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan’ either as a worker or as a manager of the department that controls the project.
16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.

18. Select the names of employees whose salary does not match with salary of any employee in department 10.
19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
22. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
23. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
24. For each department, retrieve the department number, the number of employees in the department, and their average salary.
25. For each project, retrieve the project number, the project name, and the number of employees who work on that project.
26. Change the location and controlling department number for all projects having more than 5 employees to 'Bellaire' and 6 respectively.
27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary.
28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table.
29. Delete all dependents of employee whose ssn is '123456789'.
30. Delete an employee from Employee table with ssn = '12345'(make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL
31. Perform a query using alter command to drop/add field and a constraint in Employee table.

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BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2C	**Subject Code :**U19CSC7JA
Subject Title : Programming in Java	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	To improve the programming knowledge in JAVA to create GUI applications and perform event handling functionalities in response to GUI applications

Outcomes :	At the end of the course, students should be able to 1. use the Java programming language for various programming technologies (understanding) 2. develop software in the Java programming language, (application) 3. Implement object oriented programming concepts. 4. Use and create package and interfaces in a Java program. 5. Use graphical user interface in Java programs □ 6. Create applets

L	T	P	C
4	0	0	4

UNIT I: **12 Hours**

Introduction to Java: Features of Java, JDK Environment **Object Oriented Programming Concept** Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA .**Java Programming Fundamental :**Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting

UNIT II **12 Hours**

Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes

UNIT III **12 Hours**

Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods. **Abstract Class, Interface and Packages:** Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages

UNIT IV **12 Hours**

Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.

UNIT V **12 Hours File**

Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File .**Applet Programming:** Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag

TEXT BOOK

1. E Balagurusamy , Programming with JAVA, TMH, 2007

REFERRENCES

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml,javascript, Perl Cgi , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3rd Edition., 2009
3. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009.

FACULTY OF ARTS AND SCIENCE

BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2C	**Subject Code :**U19CSC7JL
Subject Title : Programming in Java Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
4. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
5. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
6. Write java program for the following matrix operations:
   - i Addition of two matrices
   - ii Summation of two matrices
   - iii Transpose of a matrix
   - iv Input the elements of matrices from user.
7. Write a java program that computes the area of a circle, rectangle and a Cylinder using Function overloading.
8. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
9. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
10. Write a java program to draw a line between two coordinates in a window.
11. Write a java program to display the following graphics in an applet window.

i Circles
ii Ellipses
iii Arcs
iv Polygons
v Rectangles

12. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.

13. Write a program for the following string operations:

i Compare two strings
ii Concatenate two strings
iii Compute length of a string

14. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

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B.Sc Computer Science

Subject : DSC-2D	**Subject Code :**U19CSC8OS
Subject Title : Operating System	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objectives :	To provide an introduction to the internal operation of modern operating systems.

Outcomes :	At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.

L	T	P	C
4	0	0	4

UNIT-I **12 Hours**

Introduction: System Software, Resource Abstraction, OS strategies. **Types of operating systems** - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

UNIT-II **12 Hours**

Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

UNIT-III **12 Hours**

Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model **Scheduling:** Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.

UNIT-IV **12 Hours**

Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory

UNIT-V **12 Hours**

Shell introduction and Shell Scripting : **S**hell and various type of shell, Various editors present in linux, Different modes of operation in vi editor, shell script, Writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system call , Pipes and Filters, Decision

making in Shell Scripts (If else, switch), Loops in shell Functions Utility programs (cut, paste, join, tr , uniq utilities), Pattern matching utility (grep)

TEXT BOOK

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.

REFERRENCES

1. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
2. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997. th
3. W. Stallings, Operating Systems, Internals & Design Principles, 5 Edition, Prentice Hall of India. 2008.
4. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

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BOS - SCIENCE BOARD-2019

B.Sc Computer Science

Subject : DSC-2D	**Subject Code :**U19CSC8OL
Subject Title : Operating System Lab	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

Note: Following exercises can be performed using Linux or Unix

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify "cal" command to display calendars of the specified months.
6. Write a shell script to modify "cal" command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – "Entered login name is invalid".
8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users .
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
12. Write a shell script to find the sum of digits of a given number.
13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
14. Write a shell script to find the LCD(least common divisor) of two numbers.
15. Write a shell script to perform the tasks of basic calculator.
16. Write a shell script to find the power of a given number.
17. Write a shell script to find the factorial of a given number.
18. Write a shell script to check whether the number is Armstrong or not.
19. Write a shell script to check whether the file have all the permissions or not.
20. Program to show the pyramid of special character "*".

VINAYAKA MISSION'S RESEARCH FOUNDATION
(DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF THE UGC ACT 1956)

FACULTY OF ARTS AND SCIENCE

BOS - 2019

DISCIPLINE SPECIFIC CORE - 3

இளங்கலை - முதற் பருவம்

SUB : Foundation Course - i , PART - I **Credit : 3**

TITLE :(செய்யுள், உரைநடை, இலக்கியவரலாறு,**hours : 45**

இலக்கணம், பயன்பாட்டுக்கல்வி)

SUB CODE :U19FC1T1

SUB PATTERN : (THEORY)

பாட நோக்கம் :

தமிழ் மரபுக்கவிதை, புதுக்கவிதை முதலானவற்றை அறிமுகப்படுத்துதல்.

சிறுகதை, நாவல், கட்டுரை முதலான இலக்கிய வடிவங்களைக் கற்பித்தல்.

இக்கால இலக்கியத்தின் மீதான ஈர்ப்பை மிகுவித்தல்.

கற்றல் பயன் :

தமிழ் இலக்கியத்தின் மீதான ஆர்வம் மிகும்.

புதிய இலக்கிய வடிவங்களை அறிவர்

கவிதை, சிறுகதை ஆகியவற்றை படைக்க முயல்வர்.

அலகு– 1 மரபுக்கவிதைகள் (hours : 9)

1.பாரதியார் - புதுமைப்பெண்

2.பாரதிதாசன் - வான் (இயற்கை)

3.நாமக்கல் கவிஞர் - உலகம் வாழ்க

4.கண்ணதாசன் - காலக்கணிதம்

5.கவிஞர் சுரதா - கலப்பை

6.வல்லம் வேங்கடபதி - நெருப்பிலிடு

அலகு– 2 புதுக்கவிதைகள் (hours : 9)

1.சிற்பி – ஒரு விதையின் கதை

2.அறிவுமதி– நட்புக்காலம்

3.தாமரை - ஒரு கதவும் கொஞ்சம் கள்ளிப்பாலும்

4.ஈரோடு தமிழன்பன் - ஹைக்கூ கவிதைகள் (10 கவிதைகள்)

5.அப்துல் ரகுமான் - ஒப்புதல் வாக்கு மூலம்

6.அபி - மாப்பிள்ளைகள்

7.குட்டி ரேவதி - குடுகுடுப்பைச் சிறுவன்

8.மாலதி மைத்ரி - அகதி

அலகு - 3 உரைநடை (hours : 9)

1.கவிப்பேரரசு வைரமுத்து - சிற்பியே உன்னை செதுக்குகிறேன்

அலகு– 4 இலக்கிய வரலாறு - இலக்கணம் (hours : 9)

1.புதுக்கவிதை, ஹைக்கூ கவிதை தோற்றமும் வளர்ச்சியும்

2.படிமம், குறியீடு பற்றிய விளக்கங்கள்

3.சிறுகதையின் தோற்றமும் வளர்ச்சியும்

4.உரைநடையின் தோற்றமும் வளர்ச்சியும்

5.இலக்கணக் குறிப்பெழுதி விளக்கம் அறிதல்

6.கலைச்சொல்லாக்கம், எழுத்துப்பிழை நீக்கம்

7.தமிழ் எண்கள்

அலகு - 5 பயன்பாட்டுக்கல்வி - மொழிபெயர்ப்பு (hours : 9)

1.கவிதை படைத்தல்

2.வினா விடை அமைத்தல்

3.கற்பனை சந்திப்பிற்கு உரையாடல் எழுதுதல்

4.சிறுகதைகள் குறித்த விமர்சனம்

5.பொதுப்பகுதி அலுவலகப்பகுதி ஆங்கிலத்திலிருந்து தமிழில்

மொழிபெயர்த்தல்

6.தன்முனைப்பு படிப்பு - சிறுகதை

1.ஒரு காட்டில் ஒரு மான் - அம்பை

2.சுந்தரவனம் - தேவதேவன்

3.மவராசர்கள் - விந்தன்

4.ஒரு சிறு இசை - வண்ணதாசன்

5.மாத்திரை - நீலபத்மநாபன்

பார்வை நூல்கள்

1.இலக்கிய வரலாறு - முனைவர் பாக்யமேரி

2.இலக்கணமும் மொழிப்பயிற்சியும் - க.கோ.வேங்கட்ராமன்

FACULTY OF ARTS AND SCIENCE

BOS - 2019

DISCIPLINE SPECIFIC CORE - 3

இரண்டாம் பருவம்

SUB : Foundation Course -I Credit : 3

TITLE :செய்யுள், உரைநடை, இலக்கியவரலாறு, hours : 45

இலக்கணம், பயன்பாட்டுக்கல்வி

SUB CODE :U19FC1T2

SUB PATTERN : (THEORY)

பாட நோக்கம் :

தமிழ் மரபுக்கவிதை, புதுக்கவிதை முதலானவற்றை அறிமுகப்படுத்துதல்.

சிறுகதை, நாவல், கட்டுரை முதலான இலக்கிய வடிவங்களைக் கற்பித்தல்.

இக்கால இலக்கியத்தின் மீதான ஈர்ப்பை மிகுவித்தல்.

கற்றல் பயன் :

தமிழ் இலக்கியத்தின் மீதான ஆர்வம் மிகும்.

புதிய இலக்கிய வடிவங்களை அறிவர்

கவிதை, சிறுகதை ஆகியவற்றை படைக்க முயல்வர்.

அலகு– 1 – சங்க இலக்கியம் (hours : 9)

1.குறுந்தொகை

1.குறிஞ்சி - கொங்குதேர் வாழ்க்கை (2)
2.முல்லை - கார் புறந்தந்த (162)
3.மருதம் - கழனி மா அத்து (8)
4.நெய்தல் - நள்ளென்றற்றே (6)
5.பாலை - எறும்பி அளையின் (12)

2. ஐங்குறுநூறு- அன்னாய் வாழிப்பத்து (21)

3. புறநானூறு - பாடல் எண் : 91, 142,192,195,312.

அலகு– 2 நீதி இலக்கியம் (hours : 9)

1.திருக்குறள் - நட்பாராய்தல்

2.நாலடியார் - நட்பிற்பிழை பொறுத்தல்

3.இனியவை நாற்பது – 1,3,5,6,20

4.பழமொழி நானூறு – 5,27,46,73,114

5.மூதுரை – 1,2,5,10,16,17,18,26,30

அலகு -3 – நாவல் (hours : 9)

1.வேரில் பழுத்த பலா – சு.சமுத்திரம்

அலகு - 4 - இலக்கிய வரலாறு (hours : 9)

1.பதினெண் மேற்கணக்கு நூல்கள் அறிமுகம்

2.பதினெண் கீழ்க்கணக்கு நூல்கள் அறிமுகம்

3.நாவலின் தோற்றமும் வளர்ச்சியும்

அலகு– 5 - இலக்கணம் - படைப்பாற்றல் (hours : 9)

1.வல்லினம் மிகும், மிகா இடங்கள்

2.வினா, விடை வகைகள் (அறுவகை வினா, எண்வகை விடை)

3.தொகை நிலைத்தொடர்

4.தொகா நிலைத்தொடர்

5.மரபுக்கவிதை புதுக்கவிதை படைத்தல்

6.தன்முனைப்பு படிப்பு – புதினம் - 1, புதினம் - 2

(புதினத்தேர்வு மாணவர் விருப்பத்திற்குரியது)

பார்வை நூல்கள்

1.இலக்கிய வரலாறு – முனைவர் பாக்யமேரி

2.சங்க இலக்கியம் மூலமும் உரையும் - உரையாசிரியர் முனைவர்

முனைவர் வி.நாகராசன்

3.பதினெண் கீழ்க்கணக்கு நூல்கள் - உரையாசிரியர் அ.மாணிக்கனார்.

FACULTY OF ARTS AND SCIENCE

BOS - 2019

DISCIPLINE SPECIFIC CORE - 3

மூன்றாம் பருவம்

SUB : Foundation Course - I **Credit : 3**

TITLE :(காப்பியம், நாடகம், பக்தி இலக்கியம;) **hours : 45**

SUB CODE :U19FC1T3

SUB PATTERN : (THEORY)

நோக்கம்:

தமிழ் இலக்கிய வரலாற்றில் ஐம்பெரும்காப்பியங்கள், நாடகங்கள், பக்தி இலக்கியம் பெறும் இடம் குறித்து விளக்குதல்.

காப்பியச் சுவையும் நாடக இன்பத்தையும் பக்தி பெருக்கையும் மாணவர்கள் அறியச் செய்தல்.

கற்றல் பயன்கள் :

மாணவர்கள் தமிழ் இலக்கிய வரலாற்றின் காப்பியம், நாடகம், பக்தி இலக்கியம் பக்தி இலக்கியம் பற்றி அறிதல்.

வாழ்வின் வழிபாட்டின் முக்கியத்துவம் உணர்ந்து கடைப்பிடிப்பர்.

அலகு– 1 (hours : 9)

சிலப்பதிகாரம் - (கட்டுரை காதை)

மணிமேகலை - (சிறை விடு காதை)

அலகு– 2 (hours : 9)

அ. தேவாரம் - திருநாவுக்கரசர்

ஆ. திருவாசகம் - மாணிக்கவாசகர் (திருவெம்பாவை முதல் 10 செய்யுட்கள்)

இ. நாலாயிரத் திவ்ய பிரபந்தம் - நாச்சயார் திருமொழி 10 செய்யுட்கள்

அலகு -3 (hours : 9)

அ. கம்ப இராமாயணம் - வாலி வதைப்படலம் (70 பாடல்கள்)

ஆ. பெரியபுராணம் - (காரைக்கால் அம்மையார் புராணம்)

அலகு -4 (hours : 9)

உடல்மொழி : (ஆளுமை வளர்ச்சி)

அ.அடிப்படைகளைப் புரிந்து கொள்வது

ஆ.தினமும் பார்க்கும் பிரபலமான சைகைகள்

நாடகம் :

நீதி தேவன் மயக்கம் - அறிஞர் அண்ணா

அலகு -5 (hours : 9)

1.அணிகள்

அ. உவமையணி

ஆ. எடுத்துக்காட்டு உவமையணி

இ. இரட்டுற மொழிதல் அணி

ஈ. வஞ்சப் புகழ்ச்சி அணி

2.பொதுக்கட்டுரை

அ. சுற்றுப்புறச்சுழல்

ஆ. பெண்ணியம்

இ. வேளாண்மை

ஈ. சமூகத் தலைவர்கள் குறித்த தலைப்புகளில் எழுதச் செய்தல்

3.நாடகத்தின் தோற்றமும் வளர்ச்சியும்

4. பக்தி இலக்கியங்கள்

5.இரட்டைக்காப்பியங்கள்

பார்வை நூல்கள்

1.உடல்மொழி - ஆலன்& பார்பராபீஸ்

2.நீதி தேவன் மயக்கம் - அறிஞர் அண்ணா

3.தமிழ் இலக்கிய வரலாறு - முனைவர் க.பாக்ய மேரி

FACULTY OF ARTS AND SCIENCE

BOS - 2019

DISCIPLINE SPECIFIC CORE - 3

நான்காம் பருவம்

SUB : Foundation Course - I **Credit : 3**

TITLE : (பண்டைய இலக்கியம;) **hours : 45**

SUB CODE :U19FC1T4

SUB PATTERN : (THEORY)

நோக்கம்:

பண்டைய இலக்கியத்தின் முக்கியத்துவம் உணரச் செய்தல்.

நாட்டார் வாழ்வியல் கூறுகளை அறியச் செய்தல்.

கற்றல் பயன் :

பண்டைய இலக்கியத்தினை உணர்ந்து அதன் நெறியில் வாழ முற்படுதல்.

பழந்தமிழரின் மரபினை பின்பற்றி அதன் விழுமியங்களை நடைமுறைப்படுத்துதல்.

அலகு - 1 (hours : 9)

மெய்யியல்

1. (இராமலிங்க வள்ளலார் பாடல்கள்)

அ. பொன்னாகி மணியாகி …….

ஆ. பொங்கு பல சமயம் ……..

இ. மெய்ஞ் ஞான ……

ஈ. பேராய அம் ……

2.தாயுமானவர் பாடல்கள்

அ. காயாத மரமீது கல்லேறு …..

ஆ. எல்லாம் அறிந்தவரும் …..

இ. புகழும் கல்வியும் ……

ஈ. ஐவர் என்ற பல வேடர்

3.திருமந்திர பாடல்கள்

அ. நாலும் இரு மூன்றும் …..

ஆ. இலிங்கமுது …….

இ. தன்னையறிதல்

ஈ. இடனொறு மூங்கில் ....

அலகு– 2 (hours : 9)

தனிப்பாடல் திரட்டு

அ. காளமேகம் - நீரிலுள்ள.....

ஆ. ஔவையார் - தாயோடறு சுவை ...

இ. இரட்டைப்புலவர் - மாதா பிதா...

ஈ. ஒப்பிலாமணிப்புலவர் - ஆறு பெருக்காற்....

உ. ஒட்டக்கூத்தர் - கலைவாணி ...

அலகு -3 நாட்டார் வாழ்வியல் (hours : 9)

அ. வாய்மொழி இலக்கியமும், நாட்டரிலக்கியமும்

ஆ. கைவினைக் கலைகள்

இ. மண்பாண்டக் கலைகள்

ஈ. பத்த மடைப்பாய்

உ. நாட்டார் உணவு

ஊ. நாட்டார் விளையாட்டு

எ. தெருக்கூத்து

ஏ. பாவைக்கூத்து

ஐ. விடுகதைகள்

ஒ. மரபுத் தொடர்கள்

அலகு -4 கட்டுரைகள் (hours : 9)

அ. சுஜாதா - மூளையின் சாப்பாடு

ஆ. அகிலன் - எழுத்தாளர் கார்க்கி (கதைகள்)

இ. சு.நரேந்திரன் - தமிழ்நாட்டு அறிவியல் அறிஞர்கள்

ஈ. இளம்பிறை மணிமாறன் - அன்பின் வண்ணம் கம்பனின் எண்ணம்

அலகு -5 பயன்பாட்டுக் கல்வி / இலக்கணம் (hours : 9)

அ. இதழ் உருவாக்கம் (நாட்டுப்புறவியல்)

ஆ. மரபுத் தொடர் வழி – கதை உருவாக்கம்

இ. வட்டார வழக்குச் சொற்கள் (உதாரணம் : உசிர் - உயிர் ,

சிலவு – செலவு

ஈ. அருஞ்சொற் பொருள் அறிக

இ. உரை நடை தோற்றமும் வளர்ச்சியும்

பார்வை நூல்கள் :

1.இராமலிங்க வள்ளலாரின் மகா தேவமாலை - இராம. இருசுப்பிள்ளை

2.தாயுமான சுவாமிகள் பாடல்கள் - வீ. சிவஞானம்

3.தனிப்பாடல் திரட்டு - கா.சு.பிள்ளை

4.திருமந்திரம் - அடியன் மணிவாசகம்

5.நாட்டார் வழக்காற்றியல் - தே.லூர்து

6.தமிழ் இலக்கிய வரலாறு - மது.ச.விமலானந்தம்

FACULTY OF ARTS AND SCIENCE

BOS – 2019 Common to all Branches

Subject: Foundation II , PART - II **Subject code: U19FC2E1**

Subject title: ENGLISH I **Pattern: Theory**

No. of Credits: 3 **No. of hours: 45**

Syllabus

Objective:

1. To understand the various literary writers and their portrayal of life and society.
2. To understand the use of language in expression.

Course Outcome:

After completion of the curse students will be able to:

1. Comprehend the various literary writers' style, and their depiction of various things in their writing.

2. Understand the use of English language in expression.

UNIT I **Hours-9**

1. Poetry :Harmony, ED. K.TRIPATHY – PUB. OUP, CHENNAI.

1. Wordsworth : Solitary Reaper

2. Robert Frost :Stopping by Woods On a Snowy Evening

3. Masefield :Sea Fever

4. Shakespeare :All the World is a Stage

5. Hugh Clough :Say Not the Struggle Naught Availeth

UNIT II **Hours-9**

Short Stories: Popular Short Stories ED. Board OF EDITORS – PUB. OUP, CHENNAI.

4. Katherine Mansfield :A cup of tea
5. V.M.Basheer :The World Renowned Nose
6. R.K.Narayan :The Gateman's Gift
7. Leo Tolstoy :How Much Land Does a Man Need?

UNIT III **Hours-9**

Plays: Tales From Shakespeare, Published ByMadhuban Educational Books, UBS Publishers & Distributors, New Delhi.

2. The Merchant of Venice
3. Macbeth
4. Twelfth Night
5. King Lear

UNIT IV **Hours-9**

Grammar: Form And Function, By V.Sasikumar& V.Syamala, Emerald Publishers, Chennai-8.

3. Statements and Questions
4. Determiners including Articles
5. Conjunctions and other Devices

Composition: Communication Skills For Undergraduates, Dr. T.M.Farhathulah, RBA Publications, Chennai

UNIT V **Hours-9**

1. Letter Writing

2. Telegrams

3. Advertisements

Reference:

1. Advani, Shalini (2009). Schooling the National Imagination: Education, English and the Indian Modern. Delhi: Oxford University press.

2. chatterjee, Kalyan K.(1976). English Education in India: Issues and opinions.

FACULTY OF ARTS AND SCIENCE

BOS – 2019

Subject: Foundation II , PART -2 **Subject code: U19FC2E2**

Subject title: ENGLISH II **Pattern: Theory**

No. of Credits: 3 **No. of hours: 45**

Syllabus

Objective:

1. To understand the nuances of Poetry.
2. To learn the grammar, which in turn enhances reading of literature.

Course Outcome:

After completion of the course students will be able to:
1. Comprehend the poetry and its various types
2. Understand the grammar literary devices by reading poetry and enhance reading of literature.

Unit-I.Poetry : HarmonyEd. K.Tripathy– pub. OUP, Chennai. Hours- 9

1. Milton : On His Blindness
2. G.M.Hopkins : Thou Art Indeed Just, Lord
3. Shelley : Ozymandias
4. W.owen : Anthem for Doomed Youth
5. Keats : La Belle Dame Sans Merci

Unit-II. Short Stories: Popular Short Storiesed. Board of editors – pub. OUP, Chennai. Hours- 9

1. Sir Arthur Conan Doyle : The Dying Detective
2. Manohar Malgonkar : Monal Hunt
3. Ernest Hemingway : Old Man at the Bridge
4. Guy de Maupassant : The Necklace

Unit–III Plays: Tales from Shakespeare, published by Madhuban educational books, UBS Publishers & Distributors, New Delhi Hours- 9

1. A Midsummer Night's Dream
2. Much Ado About Nothing
3. Julius Caesar

Unit-IV. Grammar: Form and Function, By V. Sasikumar & V. Syamala, Emerald Publishers, chennai. Hours- 9

1. The Active and Passive Voice
2. Reported Speech
3. Conditional Clauses

Unit-V. Composition: Communication Skills for Undergraduates, Dr.T.M.Farhathulah, RBA Publications, Chennai. Hours- 9

1. Notices

2. Designing a Resume
3. Writing a Report

Reference:

1. Gardner, R.C. (1985). Social Psychology and Second Language Learning: The role of Attitudes and Motivation. London: Edward Arnold Ltd.

2. Hutchison, T., & Waters, A. (1987). English for Specific Purpose: A learner – centered approach. U.K: Cambridge University press, 1986.

FACULTY OF ARTS AND SCIENCE

BOS – 2019

Subject: Foundation-II **Subject Code: U19FC2E3**

Subject title: English- III **Pattern: Theory**

No: Credits: 03 **No. of hours: 45**

Syllabus

OBJECTIVE:

1. To enable the students to develop their communication skills in English
2. To empower the students with fluency and accuracy in the use of English language.
3. To transform into globally employable persons with placement skills

Course Outcomes:

After completion of the course students will be able to:

1. Learn or equipped with the practical, emotional, intellectual
and creative aspects of language by integrating knowledge and skills.
2. Enhance language through a task-based & learner – centric syllabus
3. Develop their critical thinking capabilities focused through the course
as an important need.

UNIT-I **Hours: 9 hours**

Prose: Education

Poem: Sarojini Naidu- "Harvest Hymn"

Letter writing: Formal and Information

Short story: O Henry-Robe of Peace (Extensive Reading)

Essential English Grammar: 1 - 6 units

UNIT- II **Hours: 9hours**

Prose: Application,

Poem: Ben Johnson – "On Shakespeare" (Reading Comprehension)

Short Story: Rudyard Kipling – The Miracle of Puran Bhagat (Extensive Reading)

Essential English Grammar: 7 - 12 units

UNIT- III **Hours: 9 hours**

Prose: Interview

Poem: Robert Herrick –'Gather Ye Rosebuds' (Note Making)

Short Story: H. G. Wells – The Truth About Pyecraft(Extensive Reading)

Essential English Grammar: 13 - 18 units

UNIT- IV **Hours: 9 hours**

Prose: Review (Super Toys)

Poem: Oliver Gold Smith- 'The Village School Master'(Developing story from hints)

Short Story: John Galsworthy – 'Quality' (Extensive Reading)

Essential Grammar Reading 19- 24 units

UNIT –V **Hours: 9 hours**

Prose: Killers

Poem: William Blake – From Auguries of Innocence (Precise Writing)

Short Story: William Somerset Maugham-Mabel (Extensive Reading)

Essential Grammar Reading 25- 50 units

TEXT BOOKS:

1.Krishnaswamy.N.T.Current English for colleges. Hyderabad: MacMillan india Ltd,2006.

2.Dahiya SPS Ed.Vision in Verse,An Anthology of Poems. New Delhi: Oxford University Press, 2002.

3.Murphy, Raymond. Essential English Grammar. New Delhi:Cambridge University Press,2009.

4.Seshadri K G Ed. Stories for Colleges. Chennai:Macmillan India Ltd,2003.

FACULTY OF ARTS AND SCIENCE

BOS – 2019

Subject: Foundation II **Subject code: U19FC2E4**

Subject title: ENGLISH IV **Pattern: Theory**

No. of Credits: 3 **No. of hours:45**

Syllabus

Objective:

1. To make the students introduce themselves to others
2. To help the students describe accurately what he/she observes and experiences
3. To make the students narrate their experiences in a coherent manner.

Course Outcome

After completion of this course students will be able to:

1. Introduce themselves to others
2. Narrate their experiences in a coherent manner
3. Describe accurately what he/ she observes and experiences.

UNIT- I **Hours- 9**

1. Personal Details
2. Positive Qualities
3. Listening to Positive Qualities
4. Relating and Grading Qualities
5. My ambition
6. Abilities and Skills
7. Self-Improvement Word Grid
8. What am I doing?
9. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

Unit –II **Hours- 9**

1. Value of Life
2. Describing Self
3. Home Word Grid
4. Unscramble Building Types
5. Plural Form of Naming Words
6. Irregular Plural Forms
7. Plural Naming Words Practice

8. Whose Words?

Unit-III **Hours- 9**

1. Plural Forms of Action Words
2. Occasions for Message
3. Words denoting place
4. Words denoting movement
5. Phrases for giving directions
6. Find the destination

Unit-IV **Hours- 9**

1. Giving directions practice
2. SMS Language
3. Converting SMS
4. Writing Short Messages
5. Sending SMS
6. The family debate
7.family Today

Unit-V Non- Detailed **Hours- 9**

"The Tempest" from "Six Tales From Shakespeare"

Reference:

1. Joy, J.L. & Peter, F.M. Let's Communicate 1, New Delhi, Trinity Press, 2014. Print.
2. Dodd, E F. Tale From Shakespeare. London: Macmillian, 1987.Print. (First three tales)

FACULTY OF ARTS AND SCIENCE

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SYLLABUS

TITLE OF PAPER Numerical and Statistical Methods Discipline Specific Elective (DSE-1A)	Subject Code	L	T	P	C
Common to B.Sc(Computer Science)	U19CSE1NM	5	1	0	6

Objectives:

- To have a good foundation in all the concepts of Numerical Methods.
- To understand the basic concepts of Statistics, Central Tendency.

UNIT – I **13 HOURS**

Algebric equations – solving by Newton –Raphson Method – Gauss elimination method for solving system of equations – Gauss Seidal method of Iteration – Numerical integration by Trapezoidal and Simpson's Rule.

UNIT – II **13 HOURS**

Euler's Method of solving an ordinary Differential Equation Numerically; Runge-Kutta;s second order method of solving ordinary differential equations.

UNIT III **13 HOURS**

Statistics - Definition - Scope and Limitation - Presentation of Data - Diagrammatic and Graphical Representation of Data.

UNIT IV **13 HOURS**

Measures of Central Tendency - Mean - Median and Mode - GM and HM - their Limitations.

UNIT V **13 HOURS**

Measures of Dispersion - Range - Mean Deviation - Quartile Deviation - Standard Deviation - Coefficient Variation - Lorenz Curve - Measures of Skewness - Karl Pearson and Bowley's methods.

LECTURE HRS :65
TUTORIAL HRS:25

Text Book :-

1. "Numerical methods in Science and Engineering", by Dr.M.K.Venketaraman M.A., M.Tech., Ph.D., National Publishing company, Madras – 1997.
2. "Mathematical Statistics" by P.R.Vittal, Margham Publications-2001

Reference Book:-

1. P.R.Vital –" Business Statistics and Mathematics"-Margam Publications

2. A.Singaravelu " Numerical Methods"Meenakshi Agency,Chennai

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SYLLABUS

TITLE OF PAPER DIFFERENTIAL AND INTEGRAL CALCULUS Discipline Specific Elective (DSE-1A)	Sub Code	L	T	P	C
B.Sc-Computer Science	U19CSE2DI	5	1	0	6

Objectives:

1. To enrich with the knowledge of Applied Mathematics.
2. To have a good foundation on Differential Equations.
3. To understand the basic concepts in Partial Differential Equations.
4. To understand the basic concepts in Laplace Transforms and Inverse Laplace Transforms.

UNIT - I **13 HOURS**

Integration by parts – definite integrals & reduction formula

UNIT -II **13 HOURS**

Double integration –change of order of integration- Cartesian coordinates –Area as a double integral – Triple integration.

UNIT- III **13 HOURS**

Particular integrals of second order Differential Equations with constant coefficients- Linear equations with variable coefficients –Method of Variation of Parameters (Omit third & higher order equations)

UNIT- IV **13 HOURS**

PDE of second order homogeneous equation with constant coefficients – Particular Integrals of F (D, D") z = f (x ,y) ,where f(x ,y) is of one of the forms e^{ax+by} , sin (a x + b y), cos (a x + b y) & $x^m y^n$

UNIT -V **13 HOURS**

Laplace Transforms –standard formulae –Basic Theorems & simple applications-Inverse Laplace Transform – Use of Laplace Transform in solving ODE with constant coefficients.

LECTURE HRS :65
TUTORIAL HRS:25

TEXT BOOK(S)

[1]. T.K.Manickavasagam Pillai & others, Integral Calculus, SV Publications.
[2] S.Narayanan, Differential Equations, S. Viswanathan Publishers, 1996.
[3] Dr. S. Arumugam and A.T. Isaac, Differential Equations and its Applications,New Gamma

Publishing House, 2011.

REFERENCE(S)

[1] M.K. Venkataraman, Engineering Mathematics, S.V. Publications, 1985, Revised Edn.
[2] M.L. Khanna, Differential Calculus, Jaiprakashnath and Co., Meerut-2004.

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SYLLABUS

TITLE OF PAPER **OPERATIONS RESEARCH** **Discipline Specific Elective (DSE-1B)**	Sub code	L	T	P	C
B.Sc(Computer Science)	**U19CSE3OR**	**5**	**1**	**0**	**6**

Objectives:

- Linear Programming is useful in finding either maximum or minimum of an expression subject to given constraints
- To minimize the cost of transporting items from various sources to different destinations
- When number of activities are to be carried out most economical way with less time consumptions can be found
- Inventory is essential to provide flexibility in operating a system or organization.
- Decision making is an integral part of any business organization. It uses to select the best among several decisions through a proper evaluation of the parameters of each decision environment.

UNIT- I: **13 HOURS**

LINEAR PROGRAMMING

Linear programming problem – Graphical method - Simplex method – Big M method – Duality principle.

UNIT- II. **13 HOURS**

TRANSPORTATION MODEL

Transportations problem – Assignment problem – Under Assignment -Traveling salesman problem

UNIT –III **13 HOURS**

NETWORK MODEL

Project Network – CPM and PERT Networks – Critical path scheduling – Sequencing Models.

UNIT- IV **13 HOURS**

INVENTORY MODELS

Inventory Model – Economic Order Quantity Model – Purchasing Model (with and without shortages) – Manufacturing Model (with and without shortages) - Stochastic Inventory Model (Stock in discrete and continuous units).

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UNIT- V **13 HOURS**

DECISION MODEL

Decision Model – Game theory – Two Person Zero sum game – Algebraic solutions Graphical solutions – Replacement model – Model based on Service life – Economic life single / multivariable search technique.

LECTURE HRS :65
TUTORIAL HRS:25

TEXT BOOK

1. Sundarasen.V, Ganapathysubramaniyam . K.S. Ganesan.K. "Operations Research" ,A.R. Publications.

2. KantiSwarup,P.K.Gupta,Man Mohan, SultanChand& Sons, New Delhi(2010)

RFERENCES:

1. Premkumar Gupta, Hira, "Operations Research" Chand & company New Delhi.

2. H.A.Taha, "Operations Research", Prentice Hall of India, 1999, Six Editions.

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SYLLABUS

SEMESTER	Subject Code	TITLE OF PAPER DISCRETE MATHEMATICS Discipline Specific Elective (DSE-1B)	L	T	P	C
	U19CSE4DM	B.Sc(Computer Science)	5	1	0	6

Objectives

1. Express a logic sentence in terms of predicates, quantifiers, and logical connectives
2. Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth tables and the properties of logic.
3. Represent a graph using an adjacency list and an adjacency matrix and apply graph theory to application problems such as computer networks.

Outcome:

1. Write an argument using logical notation and determine if the argument is or is not valid.
2. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.
3. Understand the basic principles of sets and operations in sets.
4. Demonstrate different traversal methods for graphs.
5. Model problems in Computer Science using graphs

UNIT I **13 HOURS**

Propositional logic – Propositional equivalences – Predicates and quantifiers – Nested quantifiers – Rules of inference – Introduction to proofs – Proof methods and strategy.

UNIT II **13 HOURS**

Mathematical induction – Strong induction and well ordering – The basics of counting – The pigeonhole principle – Permutations and combinations – Recurrence relations – Solving linear recurrence relations – Generating functions – Inclusion and exclusion principle and its applications

UNIT III **13 HOURS**

Graphs and graph models – Graph terminology and special types of graphs – Matrix representation of graphs and graph isomorphism – Connectivity – Euler and Hamilton paths.

UNIT IV **13 HOURS**

Algebraic systems – Semi groups and monoids – Groups – Subgroups – Homomorphism's – Normal subgroup and cosets – Lagrange's theorem – Definitions and examples of Rings and Fields.

UNIT V **13 HOURS**

Partial ordering – Posets – Lattices as posets – Properties of lattices – Lattices as algebraic systems – Sub lattices – Direct product and homomorphism – Some special lattices – Boolean algebra.

LECTURE HRS :65
TUTORIAL HRS:25

Books for Study and REFERENCE:

1.Rosen, K.H., "Discrete Mathematics and its Applications", 7th Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2011.

2. Tremblay, J.P. and Manohar.R, " Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.

3..Grimaldi, R.P. "Discrete and Combinatorial Mathematics: An Applied Introduction", 4th Edition, Pearson Education Asia, Delhi, 2007.

4.. Lipschutz, S. and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3rd Edition, 2010.

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE5AP1	Discipline Specific Elective (DSE-2A): Applied Physics-I	4	0	0	4

Total Hours: 60

Objectives:

- To acquire the knowledge of current electricity an types of resistors and
- capacitors.
- To understand the basic principles of electromagnetism an magnetic materials and
- circuits
- To study the basic principles of Lasers an optical fibres.
- To understand the Principle and application of Holography.
- To learn about alternating currents and principle of a transformer.

Outcome:

The student of computer science will have brief knowledge on theory behind conducting, semiconducting materials

Unit I : CURRENT ELECTRICITY RESISTORS AND CAPACITORS (12 Hrs)

Electric Current and its units – Definitions of important parameters – Ohm's law and its verification – Effect of temperature on resistance – Electric power and Electric energy and their units – Resistances in Series – Resistances in Parallel – Grouping of Cells – Kirchhoff's Law – Principle of a Capacitor – Capacity of a capacitor – Capacity of a parallel plate capacitor – Grouping of capacitors – Energy of a charged capacitor.

Unit II : ELECTROMAGNETISM (12 Hrs)

Magnetic lines of force – Magnetic field and magnetic induction – Hall effect – Magnetic flux – Magnetic field around a current carrying conductor – Direction of Magnetic field and electric current – Magnetic field due to a current carrying circular loop – Magnetic field due to a solenoid – Biot-Savart's law - Magnetic field inside a solenoid – Force experienced by a current carrying conductor in a magnetic field – Fleming's left hand rule – Force between two long parallel conductors – Galvanometer – shunt – conversion of a galvanometer into anammeter and voltmeter.

Unit III: MAGNETIC PROPERTIES OF MATERIALS AND MAGNETIC CIRCUITS (12 Hrs)

Force between magnetic poles – Permeability, Susceptibility, Magnetic field intensity and Intensity of Magnetisation – Magnetic Shell – Para, Dia, Ferro-magnetic Substances – Magnetic Circuits, Magneto-Motive Force – Reluctance – Permeance – Ohm's law of magnetic circuits –Reluctances in series and parallel – Comparison between Magnetic and electric circuits – Relation between MMF and magnetizing force – Magnetic circuit due to a solenoid - Hysteresis loop – Energy loss due to Hysteresis.

Unit IV : LASERS AND OPTICAL FIBRES (12 Hrs)

Spontaneous and Stimulated Emission – Population Inversion, Pumping and Active System – The Ruby Laser – Gas Laser – Semiconductor Laser – CO2 Laser – Uses Of Lasers.
Principle of a optical fiber – structure and classification of optical fibers – The numerical aperture – fibre optics communication system

Unit V : ALTERNATING CURRENT AND TRANSFORMERS (12 Hrs)

Laws of Electro-Magnetic induction- Induced EMF in a conductor – Alternating Currents – Basic Definitions – Effective value, R.M.S. value and Average value of AC – Generation of Alternating Currents and Voltages – Transformers – Principle of a transformer - step up and step down transformers

Book For Study :

1. R K Gaur And S L Gupta Engineering Physics, Chanpaj Rai Publications 2nd Edition.

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE5APL	**Discipline Specific Elective (DSE-2A): Applied Physics-I Practical**	**4**	**0**	**0**	**4**

1. Resistance of a thermistor using multimeter.
2. EMF of a thermocouple using multimeter.
3. Potentiometer – Ammeter calibration.
4. Field along the axis of the coil.
5. BG – Figure of merit.
6. Temperature coefficient - Post – Office Box.
7. Determination of L – Rayleigh's method / Anderson's method.
8. Junction diode characteristics.
9. Zener diode characteristics.
10. Bridge rectifier – study.

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE6AP2	Discipline Specific Elective (DSE-2A): Applied Physics-II	4			4

Objectives :

- To understand the different switches and the supporting devices of a computer.
- To acquire knowledge of semiconductor diodes and transistors.
- To understand various communication systems.

Outcome:

- The student of computer science will have brief knowledge on theory and the practical applications of semiconducting devices and switches.

Unit I :SWITCHES AND DEVICES (12 Hrs)

Microphones – Digital Displays – Loud Speakers, head phones and earpieces – Cathode Ray tube – Pick-ups – Heat and light sensors – relays and reed switches – Electric Motors

Unit II : SEMICONDUCTOR DIODES AND TRANSISTORS (12 Hrs)

Semiconductors – P type and N type semiconductors – Junction diode – Junction diode characteristics – semiconducting diode as a rectifier – (Other diodes) - Transistor as a current amplifier – Transistor as a switch – Transistor as a voltage amplifier – JFET

Unit III : POWER SUPPLIES, SAFETY AND MEASURING INSTURMENTS(12 Hrs)

Electricity in the home – Dangers of electricity: safety precautions – Generating Electricity – Sources of EMF – Rectifier Circuits – Smoothing Circuits – Stabilizing Circuits – Power control – Multimeters – Oscilloscopes – Signal generators

Unit IV : ANALOG ELECTRONICS (12 Hrs)

Transistor Voltage Amplifier I, II and III – FET Voltage Amplifier – Amplifiers and Feedback – Amplifiers and Matching – Impedance Matching Circuits – (Transistor Oscillators) – Operational Amplifier – Op-Amp voltage amplifier – Op-amp summing amplifier – Op-Amp Comparator – Op-Amp Integrators – Op-Amp Oscillators

Unit V : COMMUNICATION SYSTEMS (12 Hrs)

Audio Systems _ Sound recording – audio amplifier – complete hi-fi system - Radio and Television - Radio Waves, Radio systems – Black and White television – Colour Television – Cable and Satellite TV - Telephone Systems_ Simple telephone circuits - Telephone dial and keypad – Telephone exchange – Telephone links – other telephone services

Book For Study :

1. Tom Duncan, Electronics – For Today And Tomorrow, BPB Publications 3rd edition.

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE6AP2L	**Discipline Specific Elective (DSE-2A): Applied Physics-II Practical**	**2**			**2**

1. Regulated power supply using zener diode – study.
2. Transistor characteristics – CE.
3. FET characteristics.
4. Single stage CE amplifier – study.
5. FET amplifier – study.
6. Potentiometer – low range voltmeter.
7. Logic gates – study using IC's.
8. Op. amp – basic operations.

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE7AP3	Discipline Specific Elective (DSE-2B): -Applied Physics –III	4	1	0	4

Total Hours: 60

Objective: This paper is offered to the students of and chemistry as allied required. While the chemicalproperties are learnt in the major, the study of physical properties will compliment their studies.

Outcome:

The student of other course has a elaborate knowledge of physics and various field of applications which make him to have innovative ideas on his subject based on physics.

Unit – I: Classical mechanics (12 hours)

a) **Particle dynamics:** Displacement, velocity and acceleration- distance –time graph-velocity – time graph – projectile motion – uniform circular motion – tangential acceleration in circular motion – relative velocity and acceleration

b) **Lagrangian formulation :** Generalised coordinates – holonomic and non-holonomic Lagrange's equations – simple applications- Atwood's machine – simple pendulum

Unit II: Gravitation (12 hours)

a) **Classical theory of gravitation :** Kepler's laws, Newton's law of gravitation – G andmeasurement – Earth –moon system – weightlessness – earth satellites – parking orbit – earth density – mass of the Sun – gravitational potential – velocity of escape – satellite potential and kinetic energy.

b) **Einstein's theory of gravitation :**Introduction – the principle of equivalence – experimentaltests of general theory of relativity – gravitational red shift – bending of light – preihelion of mercury.

Unit -III: Properties of matter (12 hours)

a) **Elastic properties :**Elastic limit – Hooke's law – moduli of elasticity – poission ratio – relationbetween q,n,k – force in a bar due to contraction or expansion – energy stored in a wire – rigidity modulus – torsion in a wire – static torsion and torsional oscillations method**.**

b)**Viscosity and surface tension :** Newton's formula – Stoke's formula – Poiseuille's flow – molecular theory of surface tension – excess pressure over curved surface – spherical and cylindrical drops – surface energy – capillary rise – Quincke's method for mercury.

Unit – IV: Optics **(12 hours)**

a) Diffraction: Fresnel and Fraunhofer diffractions – Fraunhofer diffraction at a single slit- diffraction at multiple slits- plane diffraction grating – determination of wavelength of a special line.

b) Polarisation: Double refraction of crystals– geometry of Nicol prism – Huygen's theory – Polaroid – circular and elliptical polarization – quarter and half wave plates – production and analysis of polarized beams – optical activity.

Unit – V : Crystal Physics **(12 hours)**

Crystal structures: Introduction – periodic array of atoms – crystal lattice – unit cell – basis – symmetry considerations – classification of crystals – Bravais lattices in three dimensions – crystal planes and Miller indices – simple crystal structures.

a) Crystal diffraction: Bragg's law – experimental X-ray diffraction methods: - Laue method – rotating crystal method – powder method – neutron diffraction.

TEXT BOOKS:-

1. Nelkon and Parker Advanced level physics — Arnold Publishers – 7th edition.
2. M.Narayanamurthy and N.Nagarathnam Dynamics – (The national publishers)
3. D.S.Mathur, properties of matter, S.Chand and Co., New Delhi
4. S.Subrahmanyam and S.Brijlal, A text book of optics, S.Chand and Co (22nd edition.
5. C.Kittel , Introduction to solid state physics – Wiley eastern 5thedition.

BOOKS FOR REFERENCE:-

1. D.Halliday and R.Resnick , Physics, Part 1 (Wiley eastern)

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE7AP3L	Discipline Specific Elective (DSE-2B): Applied Physics – III Practical			2	2

LIST OF EXPERIMENTS

1. Young's modulus by stretching -vernier microscope
2. Rigidity modulus -torsional pendulum
3. Surface tension and interfacial tension - method of drops
4. Surface tension - capillary rise
5. Viscosity - capillary flow
6. Specific heat of liquid - method of mixtures (approximate radiation correction)
7. Specific heat of liquid - electrical heating
8. Sonometer -verification of laws
9. Compound bar pendulum - determination of 'g'and radius of gyration

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE8AP4	Discipline Specific Elective (DSE-2B): Applied Physics –IV	4			4

Total Hours: 60

Objective:

This paper is offered to the students of mathematics and chemistry as allied required. Most of the mathematics and chemistry learnt by the students has immediate application to many physical problems.

Outcome:

The student of other course has elaborate knowledge of physics and various fields of applications which make him to have innovative ideas on his subject based on physics.

Unit – I: Classical mechanics (12 hours)

a) **Particle dynamics:** Displacement, velocity and acceleration- distance –time graph-velocity – time graph – projectile motion – uniform circular motion – tangential acceleration in circular motion – relative velocity and acceleration

Unit II: Gravitation (12 hours)

a) **Classical theory of gravitation :** Kepler's laws, Newton's law of gravitation – G andmeasurement – Earth –moon system – weightlessness – earth satellites – parking orbit – earth density – mass of the Sun – gravitational potential – velocity of escape – satellite potential and kinetic energy.

Unit –III: Properties of matter (12 hours)

a) **Elastic properties :**Elastic limit – Hooke's law – moduli of elasticity – poission ratio – relationbetween q,n,k – force in a bar due to contraction or expansion – energy stored in a wire – rigidity modulus – torsion in a wire – static torsion and torsional oscillations method**.**

b) **Viscosity and surface tension :** Newton's formula – Stoke's formula – Poiseuille's flow – molecular theory of surface tension – excess pressure over curved surface – spherical and cylindrical drops – surface energy – capillary rise – Quincke's method for mercury.

Unit – IV: Electronics (12 hours)

a) Operational amplifier: ideal operational amplifier – inverting and non- inverting amplifiers – summing amplifier – differential amplifier – integrator – differentiator – CMRR – soling simultaneous equations.

b) Digital circuits: J-K-Flip-Flop – combinational circuits – application of Karnaugh map- Full and half binary adders - counters

Unit – V : Special theory of relativity (12 hours)

Frames of reference – inertial frames and non- inertial frames -Galilean transformations – Michelson- Morley experiment – interpretation of results – postulates of special theory of relativity – Lorentz transformation equations – length contraction – time dilation – transformation of velocities– variation mass with velocity – Mass –energy equation

TEXT BOOKS:-

1. Nelkon and Parker Advanced level physics — Arnold Publishers – 7th edition.
2. M.Narayanamurthy and N.Nagarathnam Dynamics – (The national publishers)
3. D.S.Mathur, properties of matter, S.Chand and Co., New Delhi
4. R.S.Sedha, A text book of applied electronics, S.Chand and Co., New Delhi, I edition, 1998

BOOKS FOR REFERENCE:-

1. Richard p. Feynman, robert b. Leighton & Mathew Sands, Feynman lectures on physics series, vol. 1, 2 & 3, narosa publishing, New Delhi, 8th reprint, *1995*

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SYLLABUS

Sub. Code	Title of the paper	L	T	P	C
U19CSE8AP4L	**Discipline Specific Elective (DSE-2B): Physics-IV Practical**			**2**	**2**

LIST OF EXPERIMENTS

1. Young's modulus by stretching -vernier microscope

2. Rigidity modulus -torsional pendulum

3. Surface tension and interfacial tension - method of drops

4. Surface tension - capillary rise

5. Viscosity - capillary flow

6. Specific heat of liquid - method of mixtures (approximate radiation correction)

7. Specific heat of liquid - electrical heating

8. Sonometer -verification of laws

9.Compound bar pendulum - determination of'g'and radius of gyration

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE9SE**
Subject Title : SOFTWARE ENGINEERING	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	To assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Outcome	**:**	On successful completion of this course, the student should: 1. know how to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment 2. have an ability to work in one or more significant application domains 3. Demonstrate an ability to use the techniques and tools necessary for engineering practice

L T P C
4 0 0 4

UNIT-I **(12)**

Software Process: Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy.

UNIT-II **(12)**

Software requirements: Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modeling, data, functional and behavioral models, structured analysis and data dictionary.

UNIT-III **(12)**

Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.

UNIT-IV **(12)**

Software Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards. **Software Project Management:** Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.

UNIT-V **(12)**

Testing: Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing boundary conditions, structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging.

Books Recommended:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and WitoldPedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
5. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxfor University Press, New Delhi, 1996.
6. Pfleeger, "Software Engineering", Pearson Education India, New Delhi, 1999.
7. Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall of India, New Delhi, 1991.

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BOARD OF SCIENCES
REGULATIONS-2019
SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE9SL**
Subject Title : SOFTWARE ENGINEERING LAB	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

1. Preparation of requirement document for standard application problems in standard format.(e.g Library Ma nagement System, Railway Reservation system, Hospital management System, University Admission system)
2. Project Schedule preparation .
3. Use Case diagram,Class diagram,Sequence diagram and prepare Software Design
4. Document using tools like Rational Rose.(For standard application problems)
5. Estimation of project size using Function Point(FP) for calculation.
6. Design Test Script/Test Plan(both Black box and White Box approach) Compute Process and Product Metrics (e.g Defect Density,Defect Age,Productivity,Cost etc.)>Also by Cost Estimation models.

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VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
BOARD OF SCIENCES
REGULATIONS-2019
SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE10DM**
Subject Title : DATA MINING	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	To develop an understanding of the strengths and limitations of popular data mining techniques and to be able to identify promising business applications of data mining.

Outcome	**:**	On successful completion of the course students will be able to: 1. have ability to do Conceptual, Logical, and Physical design of Data Warehouses OLAP applications and OLAP deployment 2. Have a good knowledge of the fundamental concepts that provide the foundation of data mining.

L T P C
4 0 0 4

UNIT I **(12 hours)**

Data Warehousing: Introduction- Definition and description, need for data ware housing, need for strategic information, failures of past decision support systems, OLTP vs DWH-DWH requirements-trends in DWH-Application of DWH.

UNIT II **(12 hours)**

Data Warehousing Architecture: Reference architecture- Components of reference architecture - Data warehouse building blocks, implementation, physical design process and DWH deployment process. A Multidimensional Data, Model Data Warehouse Architecture.

UNIT-III (14hours)

Data Mining: Data mining tasks-Data mining vs KDD- Issues in data mining, Data Mining metrics, Data mining architecture - Data cleaning- Data transformation- Data reduction - Data mining primitives.

Association Rule Mining: Introduction - Mining single dimensional Boolean association rules from transactional databases - Mining multi-dimensional association rules.

UNIT-IV(12hours)

Classification and Prediction: Classification Techniques - Issues regarding classification and prediction - decision tree - Bayesian classification –Classifier accuracy – Clustering – Clustering Methods - Outlier analysis.

UNIT V (10 hours)

Applications and Other Data Mining Methods: Distributed and parallel Data Mining Algorithms, Text mining- Web mining.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, " Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, USA, 2006.
2. Berson,"DataWarehousing, Data Mining and OLAP", Tata McGraw Hill Ltd, New Delhi, 2004.

REFERENCE BOOKS

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, ,Pearson Education.
2. Arun K Pujari,"Data mining techniques", Oxford University Press, London, 2003.
3. Dunham M H,"Data mining: Introductory and Advanced Topics". Pearson Education, New Delhi, 2003.
4. Mehmed Kantardzic," Data Mining Concepts, Methods and Algorithms", John Wiley and Sons, USA, 2003.
5. Soman K. P., DiwakarShyam, Ajay V., Insight into Data mining: Theory and Practice, PHI 2006

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FACULTY OF ARTS AND SCIENCE

BOARD OF SCIENCES
REGULATIONS-2019
SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE10DL**
Subject Title : DATA MINING LAB	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	T	P	C
0	0	4	2

Practical List: Practical are to be done using Weka, and a report prepared as per the format*. The operations are to be performed on built-in dummy data sets of weka and/or the downloadable datasets mentioned in references below. Also wherever applicable, the parameter values are to be varied (upto 3 distinct values). The 'Visualize' tab is to be explored with each operation.

1. **Preprocessing : Apply the following filters –**
   a. **weka>filter>supervised>attributed>**
      AddClassification ,AttributeSelection, Discretize , NominalToBinary
   b. **weka>filter>supervised>instance:**
      StratifiedRemoveFolds, Resample
   c. **weka>filter>unsupervised>attribute>**
      Add, AddExpression, AddNoise , Center , Discretize , MathExpression ,

      MergeTwoValues ,NominalToBinary , NominalToString, Normalize

      NumericToBinary ,NumericToNominal , NumericTransform , PrincipalComponent , RandomSubset , Remove , RemoveType , ReplaceMissingValues , Standardize

   d. **weka>filter>unsupervised>instance>**
      Normalize , Randomize , Standardize, RemoveFrequentValues, RemoveWithValues , Resample , SubsetByExpression
2. **Explore the 'select attribute' as follows**
   weka>attributeSelection> , FilteredSubsetEval , WrapperSubsetEval
3. **Association mining**
   weka>associations> , Apriori, FPGrowth

4. **Classification****

   weka>classifiers>bayes> , NaïveBayes , weka>classifiers>lazy> : IB1 , IBkweka>classifiers>trees , SimpleCart , RandomTree , ID3

5. **Clustering****

   weka>clusters> , SimpleKMeans , FarthestFirst algorithm, DBSCAN, hierarchicalClusterer

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE11IO**
Subject Title : BUILDING INTERNET OF THINGS	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	To assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Outcome	**:**	On successful completion of this course, the student should: 1. know how to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment 2. have an ability to work in one or more significant application domains 3. Demonstrate an ability to use the techniques and tools necessary for engineering practice

L T P C

4 0 0 4

UNIT I INTRODUCTION TO THE INTERNET OF THINGS 12 HOURS

Origins – Early Concepts and Products – Current Products and Value Propositions– Architectures and Design Patterns – Analysis of a Full Connected –Object Experience – State of the Art, Challenges and Future Directions.

UNIT II COMPONENTS IN INTERNET OF THINGS 12 HOURS

Control Units – Sensors – Communication modules – Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wifi – Rflinks – Mobile Internet – Wired Communication

UNIT III PROGRAMMING THE MICROCONTROLLER FOR IOT 12 HOURS

Basics of Sensors and actuators – Examples and Working principles of Sensors and Actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller Platform – Setting up the board - Programming for IOT – Reading from Sensors

UNIT IV COMMUNICATION 12 HOURS

Connecting microcontroller with Mobile Devices – Communication through Bluetooth and USB – Connection with the Internet using Wifi / Ethernet

UNIT V APPLICATIONS 12 HOURS

Set up cloud environment – Send data from microcontroller to cloud – Case studies – Open Source e-Health sensor platform – BeClose Elderly monitoring – Other recent projects.

TEXT BOOK:

1. Charalampos Doukas , "Building Internet of Things with the Arduino", Create space, April 2002

REFERENCE BOOK:

1. Vijay Madisetti and Arshdeep Bahga, **"Internet of Things (A Hands-on-Approach)",** 1st Edition, VPT, 2014

2. Francis daCosta, **"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything",** 1stEdition, Apress Publications, 2013

1. Cuno Pfister, Getting Started with the Internet of Things, O"Reilly Media, 2011, ISBN: 978-1-4493-9357-1
2. http://postscapes.com/
3. http://www.theinternetofthings.eu/what-is-the-internet-of-things

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE11IL**
Subject Title : BUILDING INTERNET OF THINGS LAB	**Pattern : Practical**
No of Credits : 2	**No of Hours 30**

L	T	P	C
0	0	4	2

1. Creating a Bluemix Application
2. Create and add an Internet of Things Service
3. Wire the connected device's data flow with IBM Node-RED

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code U19CSE12CC**
Subject Title : CLOUD COMPUTING	**Pattern : Theory**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	1. To classify the various Cloud computing applications 2. To build an architecture of Cloud computing IVES **3.** To understand Cloud computing standards

Outcome	**:**	On successful completion of the course students will be able to: 1. Identify the various Cloud computing applications 2. Know Cloud computing standards **3.** Know different virtualization for cloud

L T P C

4 0 0 4

UNIT I: 12 Hours

Cloud Introduction: Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , usage scenarios and Applications , Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

UNIT II: 12 Hours

Cloud Services And File System: Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

UNIT III: 12 Hours

Collaborating With Cloud:Collaborating on Calendars, Schedules and Task Management – Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing , Databases – Storing and Sharing Files- Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Collaborating via Social

Networks – Collaborating via Blogs and Wikis. 185 CS-Engg&Tech-SRM-2013

UNIT IV: **12 Hours**

Virtualization For Cloud :Need for Virtualization – Pros and cons of Virtualization – Types of
Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties
- Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.

UNIT V: **12 Hours**

Security, Standards, And Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

TEXT BOOK:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz "Cloud Computing " Wiley India Edition,2010
2. John Rittinghouse& James Ransome, "Cloud Computing Implementation Management and Strategy", CRC Press, 2010
3. Antohy T Velte ,Cloud Computing : "A Practical Approach", McGraw Hill,2009
4. Michael Miller, Cloud Computing: "Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing, August 2008.
5. James E Smith, Ravi Nair, "Virtual Machines", Morgan Kaufmann Publishers, 2006.

REFERENCE BOOKS

1. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing", Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008
2. webpages.iust.ac.ir/hsalimi/.../89.../Cloud%20Common%20standards.pptop ennebula.org,
3. www.cloudbus.org/cloudsim/, http://www.eucalyptus.com/
4. hadoop.apache.org

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3A	**Subject Code :U19CSE12CL**
Subject Title : CLOUD COMPUTING LAB	**Pattern : Practical**
No of Credits : 2	**No of Hours : 30**

L	**T**	**P**	**C**
0	**0**	**4**	**2**

1. Create virtual machines that access different programs on same platform.
2. Create virtual machines that access different programs on different platforms.
3. Exploring Google cloud for the following
    a) Storage
    b) Sharing of data
    c) manage your calendar, to-do lists,
    d) a document editing tool
4. Exploring Microsoft cloud
5. Exploring Amazoncloud

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SYLLABUS

Subject : DISCIPLINE SPECIFIC ELECTIVE 3B	**Subject Code :U19CSE13PW**
Subject Title : Project Work/Dissertation (Compulsory)	**Pattern : Practical**
No of Credits : 6	**No of Hours : 90**

L	T	P	C
1	0	8	6

- This option is to be offered only in 6th Semester.
- The students will be allowed to work on any project based on the concepts studied in core/elective or skill based elective courses.
- The group size should be maximum of three (03) students.
- Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes.
- A maximum of Four (04) projects would be assigned to one teacher.
- Theory classes will cover project management techniques.

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BOARD OF STUDIES 2019

Ability Enhancement Compulsory Courses

Semester	Sub. Code	Title of the Paper	L	T	P	Credits
I	U19AE1ES	**Environmental Science**	4	0	0	4

OBJECTIVES

a) To expand awareness on the significance of natural resources and energy.
b) To comprehend the structure and function of an ecosystem
c) To understand an aesthetic value with respect to biodiversity, aware of the threats and its conservation and realize the concept of interdependence
d) To identify with the source of kind of pollution and disaster management

OUTCOMES

- Understand core concepts and methods from ecological and physical sciences and their application in environmental problem-solving.
- Realize key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Understand the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Appreciate that one can apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Total: 60 Hours

Unit I **12 Hours**

The multidisciplinary nature of environmental studies. Definition, scope and importance need for public awareness

Unit II Natural resources **12Hours**

Renewable and non-renewable resources: natural resources and associated problems.

a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effect on forests and tribal people.
b) Water resources: use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems
c) Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer- pesticide problems, water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
f) Land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification.
Role of individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles

Unit III: Ecosystems **12 Hours**

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 ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

Unit IV: Bio-diversity and its conservation **12Hours**

Introduction – definition: genetic, species and ecosystem biodiversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and optional values – biodiversity at global, national and local levels.

India as a mega diversity nation – hot-spots of biodiversity – threats to biodiversity: Habitat loss, poaching of wild life, man – wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: in situ and Ex-situ conservation of biodiversity.

Unit V: Environmental pollution **12 Hours**

Definition, causes, 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 VI: Social issues and environment: 12 Hours

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 - environmental 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 VII: Human population and environment: 12 Hours

Population growth, variation among nations – population explosion – family welfare programme – environmental and human health -human rights – value education HIV/AIDS - women and child welfare – role of information technology in environment and human health – case studies.

Unit VIII: Field Works: 12Hours

Visit to local area to document environmental assets – rivers/ forest/ grassland/ hill/ mountain – visit to local polluted site – urban/ rural/ industrial/ agricultural – study of common plants, insects, birds – study of simple ecosystems – pond, river, hill, slopes etc. (Field work equal to 5 lecture works)

Reference books

1. Environmental Studies, N. Nandini, N. Sunitha and SucharitaTandon,Sapna Book House, 2007.
2. Text book of Environmental Science, RagavanNambiar, Scitech Publications, 2009.
3. Text book of Environmental Chemistry and Pollution Control, S.S.Dara, S.Chand and Co., 2002.
4. Environmental Chemistry, Colin Baird, W.H.Freeman and company, New York,1999.
5. Environmental Chemistry, Gary W. Van Loon and Stephen J. Duffy, Oxford University Press, 2000.
6. New Trends in Green Chemistry, V.K. Ahluwalia and M. Kidwai, Anamaya Publishers, 2006.
7. Perspectives in Environmental studies – Anubhakaushik and CP kaushik, New age international publishers, 4th edition, 2014.
8. Text Book of Environmental Studies for under gradute courses By ErachBharucha Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt. Ltd

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FACULTY OF ARTS AND SCIENCE

BOARD OF STUDIES 2019

Ability Enhancement Compulsory Courses

Subject: Ability Enhancement Course **Subject code:U19AE2EL**

Subject Title: English Communication Lab **Pattern: Practical**

No. of Credits: 4 **No. of hours: 60**

Syllabus

Objective:

To make the students comfortable in using English Language.

To help the students gain confidence in English.

To enhance the four skills of Language.

Course Outcome:

After completion of the course the students will be

1.Able to understand how to use English Language comfortably

2. Able to gain confidene in English

3.Able to learn the four skills of the language

UNIT I- Introduction: **12hours**

Theory of Communication, Types and modes of Communication

UNIT II- Language of Communication: **12 hours**
Verbal and Non-verbal
(Spoken and Written)
Personal, Social and Business
Barriers and Strategies
Intra-personal, Inter-personal and Group communication

UNIT III- Speaking Skills: **12hours**
Monologue
Dialogue

Group Discussion
Effective Communication/ Mis- Communication
Interview
Public Speech

UNIT IV- Reading and Understanding **12hours**

Close Reading
Comprehension
Summary Paraphrasing
Analysis and Interpretation
Translation(from Indian language to English and vice-versa) Literary/Knowledge Texts

UNIT V- Writing Skills **12hours**

Documenting
Report Writing
Making notes
Letter writing

Reference:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. Language, Literature and Creativity, Orient Blackswan, 2013.
4. *Language through Literature* (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas

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அடிப்படை தமிழ்

SUB :Ability Enhancement Course (Compulsory) **Credit : 4**

TITLE :அடிப்படை தமிழ **hours : 60**
SUB CODE : U19AE3BT

SUB PATTERN : (THEORY)

நோக்கம்:

மாணவர்களுக்கு அடிப்படை தமிழைப் பயிற்றுவித்து மொழி அறிவை வளர்த்தல்.

பிற மொழி மாணவர்கள் தமிழை படிக்க எழுத பயிற்றுவித்தல்.

கற்றல் பயன்கள் :

மாணவர்கள் அடிப்படைத்தமிழை அறிவர்.

மொழி வளம் உணர்ந்து பிற மொழி மாணவர்கள் கற்று தமிழ் மொழியை அறிவர்.

அலகு 1 hours:12

எழுத்துக்கள்

1.உயிர் எழுத்துக்கள்

2.மெய் எழுத்துக்கள்

3.உயிர்மெய் எழுத்துக்கள்

அலகு 2 **hours:12**

சொற்களை அமைத்தல்

அலகு 3 **hours:12**

பெயர்ச்சொற்கள்

அலகு 4 **hours:12**

வினைச்சொற்கள்

அலகு 5 **hours:12**

வாய்மொழிப்பயிற்சி : பாடல்கள்

பார்வை நூல்கள் :

1.அடிப்படை இலக்கணம் - குமரன் சந்தியா பதிப்பகம் சென்னை.

2.நற்றமிழ் இலக்கணம் - டாக்டர்.சொ.பரமசிவம்.

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Skill Enhancement Elective Courses

SUB : Skill Enhancement Elective Course **Credit : 4**

TITLE : YOGA AND MEDITATION **hours : 60**

SUB CODE : U19SE1YL

SUB PATTERN : (THEORY)

UNIT – I SURYA NAMASKAR AND ASANAS (hours:12)

Surya namaskar, Padmasana, Vajrasana, Tadasana, Bhujangasana, Konasana, Uttakatasana, Savasana.

UNIT – II PRANAYAMA (hours:12)

Surya pranayama, Chandra Pranayama, Anulom Vilom, Sheetali, Sheetkari.

UNIT – III MUDRA (hours:12)

Chin mudra, Rughi mudra, Yoga mudra, Maha mudra, Shanmukhi mudra.

UNIT – IV KRIYA (hours:12)

Kapalabathi, Bhastrika.

UNIT – V MEDITATION (hours:12)

Simple, Vibrational, Mantra, Yoga Nitra

References:

1. Dr.V.Krishnamoorthy, *Simple Yoga for Health*, Sri Mathi Nilayam, 2012.
2. Dr.Ananda Balayogi Bhavanani, *A Primer of Yoga Theory*, Dhivyananda Creations,2008.
3. Dr.S.Hema, Easy *Yoga for Beginners*, Tara yoga Publications,2008.
4. Dr.Asana Andiappan, *Ashtanga Yoga*, Asana Publications, 2009.
5. Yogacharya Sundaram, *Sundra Yoga Therapy*, Asana Publications, 2009
6. Dr.John B.Nayagam, *Mudumaikku Mutrupulli Vaikkum Muthiraigal*, Saaru Prabha Publications, 2010.

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BOARD OF STUDIES 2019

Skill Enhancement Elective Courses

Subject: Skill Enhancement Elective Courses

Subject code: U19SE2S1

Subject title: Soft Skill -I **Pattern: Theory**

No. of Credits: 4 **No. of hours: 60**

Syllabus

Objectives:

1. To enhance presentation and communication skill
2. To develop the cognitive, inter personal and teamwork skills
3. To include potential skills in the learners to prepare them to deal with the external world in a Collaborative manner, communicate effectively, take initiative, and solve problems.

Course Outcome:

After the completion of the course students will be able to:

1. Communicate more effectively
2. Identify and implement solutions in a complicated situation.
3. Meet goals and objectives of an organization by working in a collaborative manner.

Unit I- [Team Building, Organizing Meeting] **Hours: 12hours**

To know the nature of the team, To understand personal as well as professional goals of the members of the group, To work effectively in a team through building relation and interpersonal communication

How to call the meeting, how to organize a meeting in the smooth manner, how to design the agenda and prepare minutes of the meeting.

Unit II – [Dress for Success, Table Manners, Telephone etiquettes] **Hours: 12hours**

To learn selection of proper attire as per the situation,

How to carry one's self, How to project one's self in the right frame and spirit.

To learn the manners during professional meetings over lunch/dinner, Basics of the table manner.

Unit III–[Stress Management, Time Management] **Hours: 12hours**

To learn kinds of stress, To identify the right reason/s of stress, How to handle the pressure and perform efficiently in such situations, Techniques to cope with the stressful situation at a workplace.

Goal setting, To make students understand the importance of time, How to prepare the time line and allocate time to complete different tasks, How to successfully follow the prepared time-schedule.

Unit- IV –[Art **of Negotiation, Multi-tasking]** **Hours: 12hours**

To understand what is negotiation, Ways of negotiating and being successful in it, To understand the power of language and non-verbal communication.

How to prioritize the work, Importance of multi-tasking and concerns related to multi-tasking, To identify whatto multi-task.

Unit V-[Presentation Skills] **Hours: 12 hours**

To learn the skill of presentation, How to prepare it.

Reference:

1. Peggy Klaus, The Hard Truth about Soft Skills.
2. Nitin Bhatnagar. Effective Communication and Soft Skills. Pearson Education India.
3. Eric Garner. Team Building.
4. Wendy Palmer and Janet Crawford. Leadership Embodiment.

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Subject: Skill Enhancement Elective Courses **Subject code: U19SE3S2**

Subject title: Soft Skill II **Pattern: Theory**

No. of Credits: 4 **No. of hours: 60**

Syllabus

Objectives:

1. To enhance the four skills of communication.
2. To develop the verbal and non-verbal communication & skills of interpretation.
3. To increase the skills of Day-to- Day communication.

After completion of the course students will be able to

1. Use the four skills of communication
2. Learn verbal & non-verbal communication more effectively.
3. Improve the skills of day-to-day communication

UNIT I **Hours: 12 hours**

1.1. Skills in Listening and Writing
1.2. Skills in Reading and Understanding

UNIT II **Hours: 12 hours**

2.1. Skills to Read and Respond to Instructions
2.2. Skills of Interpretation and Transcoding Information

UNIT III **Hours: 12hours**

3.1. Skills in Seeking and Responding to Information
3.2. Skills of Day-to-Day communication

UNIT IV **Hours: 12 hours**

4.1. Grammatical skills and Spelling rules
4.2. Career skills

UNIT V **Hours: 12 hours**

5.1. Skills of formal and in-formal expressions
5.2. Skills of non-verbal communication

Reference:

Whitmore, Paul G.; Fry, John P., "Soft Skills: Definition, Behavioral Model Analysis, Training procedures. Professional paper 3-74.", Research Report ERIC Number: ED158043, 48 pp.

https://www.nbea.org/newsite/curriculum/police/no-67.pdf

Marcel M. Robles, Executive perceptions of the top 10 Soft Skills Needed in Today's Workplace Archived 2016-08-12 at the Way back Machine, Business Communication Quarterly, 75(4) 453-465

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BOARD OF STUDIES 2019

Skill Enhancement Elective Courses

Subject : SKILL ENHANCEMENT COURSES	**Subject Code :**U19SE4PL
Subject Title : PHP Programming	**Pattern : Practical**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	1. Describe and use the features and syntax of programming language PHP 2. Create, translate, and process HTML information using the Common Gateway Information (CGI) protocol. 3. Retrieve, insert, update, and delete data from the relational database MySQL

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Introduction to PHP: (3L)

- PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.)
- PHP with other technologies, scope of PHP
- Basic Syntax, PHP variables and constants
- Types of data in PHP , Expressions, scopes of a variable (local, global)
- PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator.
- PHP operator Precedence and associativity

Handling HTML form with PHP: (2L)

- Capturing Form Data
- GET and POST form methods
- Dealing with multi value fields
- Redirecting a form after submission

PHP conditional events and Loops: (3L)

- PHP IF Else conditional statements (Nested IF and Else)
- Switch case, while ,For and Do While Loop
  Goto , Break ,Continue and exit

PHP Functions: (3L)

- Function, Need of Function , declaration and calling of a function
- PHP Function with arguments, Default Arguments in Function
- Function argument with call by value, call by reference
- Scope of Function Global and Local

String Manipulation and Regular Expression: (3L)

- Creating and accessing String , Searching & Replacing String
- Formatting, joining and splitting String , String Related Library functions
- Use and advantage of regular expression over inbuilt function
- Use of preg_match(), preg_replace(), preg_split() functions in regular expression

Array:

- Anatomy of an Array ,Creating index based and Associative array ,Accessing array
- Looping with Index based array, with associative array using each() and foreach()
- Some useful Library function

Software Lab Based on PHP:

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
   Sample string : 'The quick " " brown fox'

   Expected Output :Thequick""brownfox
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
11. Write a PHP script that checks if a string contains another string.
12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.

13. Create a script to construct the following pattern, using nested for loop. *
    * *
    * * *
    * * * *
    * * * * *
14. Write a simple PHP program to check that emails are valid.
15. WAP to print first n even numbers.
16. $color = array('white', 'green', 'red")
    Write a PHP script which will display the colors in the following way :
    Output : white, green, red,
    - green
    - red
    - white
17. Using switch case and dropdown list display a “Hello” message depending on the language selected in drop down list.
18. Write a PHP program to print Fibonacci series using recursion.
19. Write a PHP script to replace the first 'the' of the following string with 'That'.

    Sample : 'the quick brown fox jumps over the lazy dog.'

Expected Result : That quick brown fox jumps over the lazy dog.

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FACULTY OF ARTS AND SCIENCE

BOARD OF STUDIES 2019

Skill Enhancement Elective Courses

Subject : SKILL ENHANCEMENT COURSES	**Subject Code :**U19SE5SL
Subject Title : Programming in SCILAB	**Pattern : Practical**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	1. To provide students with sound foundation in applied mathematics to solve real life problems in industry. 2. To provide hands on experience in using Scilab software to handle real life problems.

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Unit I- Introduction to Programming: Components of a computer, working with numbers, Machine code, Software hierarchy. (2L)

Unit II- Programming Environment: SCILAB Environment, Workspace, Working Directory, Expressions, Constants, Variables and assignment statement, Arrays. (3L)

Unit III- Graph Plots: Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save. (2L)

Unit IV-Matrices and Some Simple Matrix Operations, Sub- Matrices. (2L)

Unit IV- Procedures and Functions: Arguments and return value (2L)

Unit V-Control Statements: Conditional statements: If, Else, Else-if, Repetition statements:While, for loop. (3L)

Unit VI- Manipulating Text: Writing to a text file, Reading from a text file, Randomising and sorting a list, searching a list. (2L)

Recommended Books:

1. M.Affouf, SCILAB by Example ,CreateSpace Independent Publishing Platform,2012
2. H. Ramchandran, A.S. Nair, SCILAB , S.Chand, 2011

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Software Lab Based on SCILAB:

1. Write a program to assign the following expressions to a variable A and then to print out the value of A.
   a. (3+4)/(5+6)
   $\frac{2\pi^2}{\sqrt{2}}$
   b.
   c. d.$(0.0000123 + 5.67\times10^{-3}) \times 0.4567\times10^{-4}$
2. Celsius temperatures can be converted to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
3. Set up a vector called N with five elements having the values: 1, 2, 3, 4, 5. Using N, create assignment statements for a vector X which will result in X having these values: a.2, 4, 6, 8, 10
   b. 1/2, 1, 3/2, 2, 5/2
   c. 1, 1/2, 1/3, 1/4, 1/5
   d. 1, 1/4, 1/9, 1/16, 1/25
4. A supermarket conveyor belt holds an array of groceries. The price of each product (in pounds) is [0.6, 1.2 ,0.5, 1.3] ; while the numbers of each product are [3, 2 ,1 ,5]. Use MATLAB to calculate the total bill.
5. Thesortrows(x) function will sort a vector or matrix X into increasing row order. Use this function to sort a list of names into alphabetical order.
6. The "identity" matrix is a square matrix that has ones on the diagonal and zeros elsewhere. You can generate one with theeye() function in MATLAB. Use MATLAB to find a matrix B, such that when multiplied by matrix A=[1 2; -1 0] the identity matrix I=[1 0; 0 1] is generated. That is A*B=I.
7. Create an array of N numbers. Now find a single MATLAB statement that picks out from that array the 1,4,9,16,…,√Nthentries, i.e. those numbers which have indices that are square numbers.
8. Draw a graph that joins the points (0,1), (4,3), (2,0) and (5,-2).
9. The seeds on a sunflower are distributed according to the formula below. Plot a small circle at each of the first 1000 co-ordinates :
   $r_n = \sqrt{n}$
   $\theta_n = \frac{137.51}{180}\pi n$
10. Calculate 10 approximate points from the function y=2x by using the formulae: i.x_n = n
    ii.y_n = 2n + rand - 0.5

    Fit a line of best fit to these points using the function polyfit() with degree=1, and generate co-ordinates from the line of best fit using polyval(). Use the on-line help to find out how to use these functions. Plot the raw data and the line of best fit.

11. Calculate and replay 1 second of a sinewave at 500Hz with a sampling rate of 11025Hz. Save the sound to a file called "ex35.wav". Plot the first 100 samples.
12. Calculate and replay a 2 second chirp. That is, a sinusoid that steadily increases in frequency with time, from say 250Hz at the start to 1000Hz at the end.
13. Build a square wave by adding together 10 odd harmonics: 1f, 3f, 5f, etc. The amplitude of the nthharmonic should be 1/n. Display a graph of one cycle of the result superimposed on the individual harmonics.
14. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with: i.FtoC(96)
    ii. lookfor Fahrenheit
    iii. help FtoC
15. Write a program to input 2 strings from the user and to print out (i) the concatenation of the two strings with a space between them, (ii) a line of asterisks the same length as the concatenated strings, and (iii) the reversed concatenation. For example:
    i. Enter string 1: Mark
    ii. Enter string 2: Huckvale
    iii. Mark Huckvaleiv.
    iv. **********
    v. elavkcuHkraM

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BOARD OF STUDIES 2019

Skill Enhancement Elective Courses

Subject : SKILL ENHANCEMENT COURSES	**Subject Code :**U19SE6RL
Subject Title : R Programming	**Pattern : Practical**
No of Credits : 4	**No of Hours : 60**

Objective	**:**	To give an introduction to the software *R* and how to write elementary programs

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Introduction: Overview and History of R,Getting Help,Data ypes,Subsetting,Vectorized Operations, Reading and Writing Data. (5L)

Control Structures, Functions,lapply,tapply, split,mapply, apply, Coding Standards.(5L)

Scoping Rules, Debugging Tools, Simulation,R Profiler. (5L)

Reference Book

W. N. Venables, D. M. Smith, An Introduction to R, R-core team,2015

Software Lab Based on R Programming:

1. Write a program that prints 'Hello World' to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement the following sorting algorithms: Selection sort, Insertion sort, Bubble Sort
8. Implement linear search.
9. Implement binary search.
10. Implement matrices addition , subtraction and Multiplication

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BOS- 2019

Subject: Value Added Course **Subject Code:**U19VA1WS

Subject title: Women Studies **Pattern: Theory** **No:**

Credits: 2No. of hours: 30

Syllabus

Objectives:

1. This paper aims to familiarize students with key concepts, issues, and debates in Women's Studies
2. To make them aware of the Women's exclusion from knowledge and need for Women's Studies
3. As an academic discipline. It deliberates on the prevailing strategies of the growth of Women's Studies in India and abroad

Course Outcomes:

Upon successful completion of this course, students should be able to:

1. Understand and engage with central debates in the field of Women's and Gender Studies.
2. Define and apply basic terms and concepts central to this field.
3. Apply a variety of methods of analyzing gender in society, drawing upon both primary and secondary sources.
4. Apply concepts and theories of Women's and Gender Studies to life experiences and historical events and processes.
5. Communicate effectively about gender issues in both writing and speech, drawing upon Women's and Gender Studies scholarship and addressing a public audience.

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Unit I – Introduction to Women's Studies **Hours: 6 hours**

Key concepts in Gender studies.

Need, Scope and challenges of Women's Studies – Women's Studies as an academic discipline. Women's Studies to Gender Studies, Need for Gender Sensitization.

Women's Movements – global and local: Pre-independence, Post-independence and Contemporary Debates.

National Committees and Commissions for Women.

Unit II – Women and Health **Hours: 6 hours**

Life Cycle Approach to Women's Health – Health status of women in India, factors influencing health and Nutritional status.

Maternal and Child Health (MCH) to Reproductive and Child health approaches.

Issues of declining Child Sex Ratio, Widowhood and old age.

Occupational and mental health.

Health, Hygiene and Sanitation.

National Health and Population Policies and Programmes.

Unit III – Women Empowerment and Development **Hours: 6 hours**

Theories of Development, Alternative approaches – Women in Development (WID), Women and Development (WAD) and Gender and Development (GAD).

Empowerment- Concept and indices: Gender Development Index (GDI), Gender Inequality Index (GII), Global Gender Gap Index (GGGI).

Women Development approaches in Indian Five – Year Plans.

Women and leadership– Panchayati Raj and Role of NGOs and Women Development.

Sustainable Development Goals, Policies and Programmes.

Unit IV – Women Law and Governance **Hours: 6 hours**

Rights: Gender Equality, Gender Discrimination, Women's Rights as Human Rights.

Constitutional provisions for Women in India.

Personal laws, Labour Laws, Family Courts, Enforcement machinery – Police and Judiciary.

Crime against Women and Child: Child Abuse, Violence, Human Trafficking, Sexual Harassment at Workplace Act, 2013 – Legal protection

International Conventions and Legislations Related to Women's Rights.

Unit V – Gender and Media **Hours: 6 hours**

Discourse on Women and Media Studies- Mainstream Media, Feminist Media.

Coverage of Women's issues and issues of women in Mass Media and Media Organizations (Audio-Visual and Print media).

Digital Media and legal protection.

Alternative Media – Folk Art, Street Play and Theatre.

Indecent Representation of Women (Prohibition) Act, 1986, Impact of media on women.

Recommended Reading Text Books / Reference Books

- Khullar, Mala. Writing the Women's Movement: A Reader ed. New Delhi: Zubaan, 2005.
- Jain, Devaki and Pam Rajput. Narratives from the Women's Studies Family: Recreating knowledge. New Delhi: Sage, 1942.
- Programme of Women's Studies. New Delhi: ICSSR, 1977. Desai, Neera and Maithrey Krishnaraj. Women and Society in India. Delhi: Ajantha, 1987.
- Women in Contemporary India. Ed. Alfred De Souza Delhi: Ajanta, 1987.
- Mies, Maria Indian Women and Patriarchy. Delhi: Concept, 1980. Nanda, B.R. Indian Women: From Purdah to Modernity. Delhi: Vikas, 1976.
- Women's Studies in India: A Reader. Ed. Mary John. Penguin: New Delhi, 2008.

BOS- 2019

Subject : Value Added Course	**Subject Code :**U19VA2IC
Subject Title : Indian Constitution – Configurable Structure	**Pattern : Theory**
No of Credits : 2	**No of Hours : 30**

Objective	**:**	To provide the basic knowledge of the development and of principles enshrined in the Constitution of India
Outcome		It frames fundamental political principles, procedures, practices, rights, powers, and duties of the government

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2	0	0	2

Unit – I **6 hours**

Introduction: Significance of the Constitution; Making of the Constitution- Role of the Constituent Assembly, Salient features, the preamble, Citizenship, procedure for amendment of the Constitution.

Unit – II **6 hours**

Fundamental Rights: Right to Equality, the Right to Freedom, the Right against Exploitation, the Right to Freedom of Religion, Cultural and Educational Rights and Right to Constitutional Remedies.

Unit – III **6 hours**

Nature of the Directive principles of State Policy: Difference between of Fundamental Rights and Directive Principles of State Policy – Implementation of Directive Principles of State Policy, Fundamental Duties.

Unit – IV **6 hours**

Union Government – Powers and Functions of the President, the Prime Minister, Council of Ministers. Composition, Powers and functions of the Parliament, Organisation of Judiciary, The Supreme Court: Powers and Functions. LokSabha and RajyaSabha - Powers and Functions.

Unit – V **6 hours**

State Government – Powers and Functions of Governor, Chief Minister, Council of Minister. Composition, Powers and functions of state Legislature, Local Government and the Constitution, Relation between the Union and the States. The High Court: Powers and Functions.

Text Books

1. M. V. Pylee – An Introduction to Constitution of India, Vikas Publications, New Delhi-2005.
2. Subhash C. Kashyap – Our Constitution: An Introduction to India's Constitution & Constitutional Law, National Book Trust, New Delhi-2000.
3. Durga Das Basu – Introduction to the Constitution of India, PHI, New Delhi-2001.
4. D. C. Gupta – Indian Government & Politics, Vikas Publications, New Delhi-1994, VIII Edition.
5. J. C. Johari – Indian Government & Politics, Sterling Publishers, Delhi-2004.

Reference Books

1. V. D. Mahajan – Constitutional Development & National Movement in India, S. Chand & Company, New Delhi.
2. Constituent Assembly Debates, Lok-Sabha Secretariat, New Delhi-1989.
3. Granville Austin – Working of a Democratic Constitution: The Indian Experience, Oxford University Press, New Delhi-1999.
4. A. P. Avasthi – Indian Government & Politics, Naveen Agarwal, Agra-2004.
5. S. A. Palekar – Indian Constitution, Serials Publication, New Delhi-2003.

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BOS- 2019

Subject : Value Added Course	**Subject Code :**U19VA3BL
Subject Title Basic Life Support and First Aid(Demonstration)	**Pattern : Theory**
No of Credits : 2	**No of Hours : 30**

Total Hours – 20

Course Description

This course is designed to help students develop and understanding of community emergencies and be able to render first aid services as and when need arises.

General Objectives

Upon completion of this course, the students shall be able to:

1. Describe the rules of first aid.
2. Demonstrate skills in rendering first aid in case of emergencies.

Unit	Learning Objectives	Content	Hr.	Teaching learning activities	Assessment methods
I	Describe the importance and principle of first aid	**Introduction** a) Definition, Aims and Importance of first aid b) Rules/ General principles of First Aid c) Concept of emergency	2	Lecture cum discussions	Short answer Objective type
II	Demonstrate skill in first aid techniques	**Procedures and Techniques in First Aid** a) Preparation of First Aid kit.	8	Lecture cum discussions Demonstration Videos Simulation exercises.	Short answer Objective type Return demonstration

		b) Dressing, bandaging and splinting(spiral, reverse spiral, figure of 8 spica, shoulder, hip, ankle, thumb, finger, stump, single and double eye, single and double ear, breast, jaw, capelin), triangle bandage uses, abdominal binder and bandage, breast binder, T and many tail bandage, knots reef, clove. c) Transportation of the injured d) CPR : Mouth to mouth, Sylvester, Schafer, External cardiac massage			
III	Describe first aid in common emergencies	**First Aid in emergencies** a) Asphyxia, drowning, shock b) Wounds and Bleeding c) Injuries to the Bones, Joints and Muscle - fractures, sprains, strains, hanging, falls d) Burns and scalds e) Poisoning – ingestion, inhalation, bites and stings f) Foreign body in eye, ear, nose and throat.	6	Lecture cum discussions. Videos Demonstration	Short answer Objective type Return demonstration

IV	List various community emergencies and community resources.	**Community Emergencies & Community Resources** a) Fire, explosion, floods, earth-quakes, famines etc b) Role of nurses in disaster management c) Rehabilitation d) Community Resources - Police, Ambulance services - Voluntary agencies-local, state national and international	4	Lecture cum discussions. Videos Mock drill Simulation exercise Videos Field visit to voluntary agencies.	Short answer Objective type Essay type

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BOS- 2019

Semester	Sub. Code	Title of the Paper	L	T	P	Credits
	U19VA4FS	**Fire safety (Demonstration)**	2	0	0	2

INSTRUCTIONAL OBJECTIVES

a) To expand awareness on the fire accidents.
b) To know the minimum requirement of the industrial establishment
c) To identify the sources of fire accidents in various places

SUBJECT OUTCOMES

- Understand basic fire safety and what to do in the event of an emergency.
- Understand the values of fire risk control.
- Understand the generic necessities of a Fire Marshal
- Have the skills to initiate emergency processes and promote a positive answer from others
- Be able to detect fire safety hazards and risks in the workplace and public sector.
- Be able to ensure the availability and usage of fire safety equipment's.
- Know how to establish alternative evacuations and fire movements in the workplace and report on their effectiveness

UNIT – IINTRODUCTION ABOUT FIRE SOURCES

Fire reasons and sources in institutions, shopping mall, theatres, industries, electrical and forest, types of fuels, fire safety symbols

UNIT – II IMPACT OF FIRE ACCIDENTS

Various impact of fire accidents in industries, petrol bunks and public sector places (Economic loss, resettlement, and reconstruction)

UNIT – III FIRE SAFETY RULES

Fire safety rules for machinery industries, schools, vehicles, commercial places, and petrochemical industries.

UNIT – IV FIRE ACCIDENTS CONTROL METHODS

First aid for Industrial fire accidents, petrol bunk accidents, vehicle fire accidents, school fire accidents, complex fire accidents, and forest fire accidents

UNIT – V FIRE SAFETY LAWS

Various fire safety laws for establishing academic institutions, industries, and public sector places

Text Book

1. Manual of Fire Safety, Seshaprakash, cbs publishers and distributors pvt ltd.

2. Fire Safety in Buildings 2nd Edition (English, Hardcover, Shri V. K. Jain), Publisher: New Age International, ISBN: 9788122430837, 812243083X, Edition: 2ndEdition, 2010, Pages: 652.
3. Fire Safety Management Handbook, 3rd Edition, Daniel E. Della-Giustina, CRC Press, Published February 7, 2014, Reference - 279 Pages - 40 B/W, llustrations, ISBN 9781482221220.

Reference books

1. Evaluation of Fire Safety, Author(s): D. Rasbash, G. Ramachandran, B. Kandola, J. Watts, M. Law Publisher: Wiley, Year: 2004, ISBN: 9780471493822, 0471493821.
2. Fire Risk: Fire Safety Law and Its Practical Application, Author(s): Allan Grice, Publisher: Thorogood Publishing, Year: 2009, ISBN: 1854186035,9781854186034.
3. Introduction to Fire Safety Management: The handbook for students on NEBOSH and other fire safety courses, Author(s): Andrew Furness, Martin Muckett, Year: 2007, ISBN: 0750680687, 9780750680684, 9780080 551 791.

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BOS- 2019

Semester	Sub. Code	Title of the Paper	L	T	P	Credits
	U19VA5IS	**Industrial safety**	2	0	0	2

INSTRUCTIONAL OBJECTIVES

a) To enable students to conduct safety audit reports effectively.
b) To have awareness about sources of information for safety promotion and training.
c) To train students with estimation of safety performance.
d) To know about the different kinds of industries and their operations.
e) To know the minimum requirement of the industry establishment
f) To identify the sources of accidents in various places.
g) To achieve and understand the principles of safety management.

SUBJECT OUTCOMES

- Design,Establish,and Implement the industrial systemto improve safety.
- Manner of investigationsonunwantedincidents or accidents using rootcauseanalysis
- Achieve the comfort of industry, worker and machine safety.
- Develop communication system effectivelyonhealthandsafetyamongtheemployeesandwith societyatlarge.
- Demonstratesensitivity ofthesafety,and legalissues regarding accidents.
- Understand theimpact of Firesafety and environment safety while the productivity for societyatlarge.

UNIT – ICONCEPTS AND TECHNIQUES

Types of industries (construction, machinery, chemical, petrochemical, textile, and cracker), Evolution of modern safety concept- Safety policy - Safety Organization - line and staff functionsfor safety- Safety Committee. Incident Recall Technique (IRT), safety survey, safety inspection, safety sampling, evaluation of performance of supervisors on safety.

UNIT – II INDUSTRIAL SAFETY EDUCATION AND TRAINING

Safety training, needs of Training methods – programme, seminars,conferences, competitions – method of promoting safe practice - motivation – communication - role of government agencies and private consulting agencies in safety training – creatingawareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive

UNIT – III HAZARDOUS WASTE MANAGEMENT

Hazardous waste management in India-waste identification, characterization and classification- technological options for collection, treatment and disposal of hazardous waste, Health hazards-toxic and radioactive wastes-incineration and verification.

UNIT – IV POLLUTION CONTROL IN PROCESS INDUSTRIES

Pollution control in process industries like cement, paper, petroleum-petroleum products-textile- tanneries-thermal power plants – dying and pigment industries - eco-friendly energy

UNIT – V INDUSTRIAL FIRE PROTECTION SYSTEMS

Sprinkler – hydrants-special fire suppression systems like deluge and emulsifier, selection criteria of the above installations and maintenance– alarm and detection systems. Other suppression systems –CO_2 system, foam system, Dry chemical powder (DCP) system, halon system – need for halon replacement – smoke venting.

Text Book

1. Dan Petersen, "Techniques of Safety Management", McGraw-Hill Company, Tokyo, 1981.
2. Relevant Indian Standards and Specifications, BIS, New Delhi.
3. "Safety and Good House Keeping", N.P.C., New Delhi, 1985.
4. T Miller, Environmental Science: Working with the Earth, 11th Edition, Wadsworth Publishing Co., Belmont, CA, 2006
5. M.J Hammer,., and M.J Hammer,., Jr., Water and Wastewater Technology, Pearson Prentice Hall, 2006
6. Rao, CS, "Environmental pollution engineering" Wiley Eastern Limited, New Delhi, 1992.
7. S. P. Mahajan, "Pollution control in process industries", Tata McGraw Hill Publishing Company, New Delhi, 1993.
8. V., Subramanian. The Factories Act 1948 with Tamilnadu factories rules 1950, Madras, Book Agency, 21st ed., Chennai, 2000.
9. C.RayAsfahl , Industrial Safety and Health management, Pearson Prentice Hall,2003.
10. N.V Krishnan. Safety Management in Industry Jaico Publishing House, Bombay, 1997
11. R.S.Gupta., Hand Book of Fire Technology, Orient Blackswan, 2010

Reference books

1. "Accident Prevention Manual for Industrial Operations", N.S.C.Chicago, 1982.
2. Blake R.B., "Industrial Safety" Prentice Hall, Inc., New Jersey, 1973.
3. Heinrich H.W. "Industrial Accident Prevention" McGraw-Hill Company, New York, 1980
4. John Ridley, "Safety at Work", Butterworth and Co., London, 1983