Scheme & Syllabus

Bachelor of Engineering

Computer Science & Engineering

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

GROUP A: I Semester & GROUP B: II Semester
Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits	Remarks
			Theory Slot			Practical Slot							
			End sem	Mid sem	Quiz/Assignment	End Sem	Lab work/ sessional		L	T	P		
1.	100201	Engineering Physics *BSc*	70	20	10	30	20	150	4	1	2	6	
2.	100202	Energy, Environment, *HMSC* Ecology & Society	70	20	10	-	-	100	4	1	-	5	
3.	100203	Basic Computer Engineering	70	20	10	30	20	150	4	1	2	6	
4.	100204	Basic Mechanical Engineering	70	20	10	30	20	150	4	1	2	6	
5.	100205	Basic Civil Engineering & Mechanics	70	20	10	30	20	150	4	1	2	6	
6.	100206	Language Lab. & Seminars	-	-	-	30	20	50			2	1	Grand Total
		Total	350	100	50	150	100	750	20	5	10	30	750

01 Theory Period=1 Credit; 02 Practical Periods =1 Credit

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

GROUP B: I Semester & Group A: II Semester

W.E.F JULY 2017

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits	Remarks
			Theory Slot			Practical Slot							
			End sem	Mid sem	Quiz/Assignment	End Sem	Lab work/ sessional		L	T	P		
1.	100101	Engineering Chemistry	70	20	10	30	20	150	4	1	2	6	
2.	100102	Engineering Mathematics -I	70	20	10	-	-	100	4	1	-	5	
3.	100103	Technical English	70	20	10	30	20	150	4	1	2	6	
4.	100104	Basic Electrical & Electronics Engineering	70	20	10	30	20	150	4	1	2	6	
5.	100105	Engineering Graphics	70	20	10	30	20	150	4	1	2	6	
6.	100106	Manufacturing Practices	-	-	-	30	20	50			2	1	Grand Total
		Total	350	100	50	150	100	750	20	5	10	30	750

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

B.E. III Semester (Computer Science & Engineering)
For batches admitted in July, 15 & July, 16 (to be implemented in July, 2017

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits
			Theory Slot			Practical Slot			L	T	P	
			End Sem.	Mid Sem. Test	Quiz/ Assignment	End Sem.	Term work					
							Lab Work & Sessional					
1.	BCSL301	Mathematics III	70	20	10	-	-	100	3	1	-	4
2.	BCSL302	Digital Electronics	70	20	10	30	20	150	2	1	2	4
3.	BCSL303	Object Oriented Programming and Methodology	70	20	10	30	20	150	2	1	2	4
4.	BCSL304	Computer Graphics	70	20	10	30	20	150	2	1	2	4
5.	BCSL305	Operating System	70	20	10	-	-	100	3	1	-	4
6.	BCSP306	Hardware Lab		-	-	30	20	50	-	-	4	2
7.	BCSS307	Seminar/ Presentation/ GD		-	-	-	50	50	-	-	4	2
8.	BCSS308	Integrated Ethics and Attitude		-	-	-	50	50	-	-	4	2
9.		NSS/NCC	-	-	-	-	-	-	-	-	-	Qualifier
Total			350	100	50	120	180	800	12	5	18	26

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

B.E. IV Semester (Computer Science & Engineering)

For batches admitted in July, 15 & July, 16 (to be implemented in July, 2017

Subject wise distribution of marks and corresponding credits

S.NO.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits
			Theory Slot			Practical Slot						
			End Sem.	Mid Sem. Test	Quiz/ Assignment	End Sem.	Term work / Lab Work & Sessional		L	T	P	
1.	BCSL401	Discrete Structures	70	20	10	-	-	100	3	1	-	4
2.	BCSL402	Design & Analysis of Algorithms	70	20	10	30	20	150	2	1	2	4
3.	BCSL403	Database Management System	70	20	10	30	20	150	2	1	2	4
4.	BCSL404	Computer Networks	70	20	10	30	20	150	2	1	2	4
5.	BCSL405	Computer System Organization	70	20	10	-	-	100	3	1	-	4
6.	BCSP406	Unix/Linux Lab	-	-	-	30	20	50	-	-	4	2
7.	BCSS407	Idea Generation	-	-	-	-	50	50	-	-	4	2
8.	BCSS408	Communication Skills	-	-	-	-	50	50	-	-	4	2
9.		NSS/NCC	-	-	-	-	-	-	-	-	-	Qualifier
Total			350	100	50	120	180	800	12	5	18	26

01Theory Period=1 Credit; 02 Practical Periods =1 Credit

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

B.E. V Semester (Computer Science & Engineering)

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits
			Theory Slot			Practical Slot						
			End sem	Mid Sem	Quiz/	End Sem	Lab work & Sessional		L	T	P	
1.	BCSL501	Principles of Management & Economics	70	20	10	-	-	100	3	1	-	4
2.	* 502	Elective - I* ( )	70	20	10	-	-	100	3	1	-	4
3.	BCSL503	Software Engineering	70	20	10	30	20	150	3	1	2	5
4.	BCSL504	Microprocessor & Interfacing	70	20	10	30	20	150	3	1	2	5
5.	BCSL505	Theory of Computation	70	20	10	30	20	150	3	1	2	5
6.	BCSP506	Lab (Java Programming)	-	-	-	30	20	50	-	-	2	1
7.	BCSS507	Self Study (Internal Assessment)	-	-	-	-	50	50	-	-	2	1
8.	BCSS508	Seminar & Group Discussion (Internal Assessment)	-	-	-	-	50	50	-	-	2	1
		Total	350	100	50	120	180	800	15	5	12	26

01 Theory period:01 Credit; 02 Practical Periods: 01 Credit

* List of Elective   BCSL502: Networking with TCP/IP
BCSL509: Internet Technology & web Designing
BCSL510: Management Information System

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

B.E. VI Semester (Computer Science & Engineering)

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods per week			Total Credits
			Theory Slot			Practical Slot						
			End sem	Mid Sem	Quiz/	End Sem	Lab work & Sessional		L	T	P	
1.	*	Elective - II	70	20	10	-	-	100	3	1	-	4
2.	BCSL602	Mobile Computing	70	20	10	-	-	100	3	1	-	4
3.	BCSL603	Software Project Management	70	20	10	30	20	150	3	1	2	5
4.	BCSL604	Compiler Design	70	20	10	30	20	150	3	1	2	5
5.	BCSL605	Network & Web Security	70	20	10	30	20	150	3	1	2	5
6.	BCSP606	Minor Project	-	-	-	30	20	50	-	-	2	1
7.	BCSS607	Self Study (Internal Assessment)	-	-	-	-	50	50	-	-	2	1
8.	BCSS608	Seminar & Group Discussion (Internal Assessment)	-	-	-	-	50	50	-	-	2	1
		Total	350	100	50	120	180	800	15	5	12	26

01 Theory period:01 Credit; 02 Practical Periods: 01 Credit

* List of Elective:
    BCSL601 Parallel Processing
    BCSL609 Information Theory & Coding
    BCSL610 Cloud Computing

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

Scheme of Examination
B.E. (Computer Science & Engineering)
For batches admitted in July, 14 (to be implemented in July, 2017)

Semester – VII

S.N.	Subject Code (New)	Subject Name & Title	Maximum Marks Allotted					Total Marks	Credits Allotted Subject wise			Total Credits	Remarks
			Theory Slot			Practical Slot							
			End Sem.	Mid Sem. Exam	Quiz, Assignment	End Sem	Term Work						
							Lab Work & Sessional		L	T	P		
1	CSL 701	Artificial Intelligence and Expert Systems	70	20	10	30	20	150	3	1	2	6	
2	CSL 702	Compiler Design & Translator	70	20	10	30	20	150	3	1	2	6	
3	CSL 703	Parallel Processing	70	20	10	30	20	150	3	1	2	6	
4	CSL 704	Networking with TCP/IP	70	20	10	-	-	100	3	1	-	4	
5	CSL 705	Internet Technology & web Designing (Elective-I)	70	20	10	-	-	100	3	1	-	4	
6	CSD 706	Major Project-I	-	-	-	50	40	90	0	0	4	4	
7	CSS 707	Self Study (Internal Assessment)	-	-	-	-	30	30	0	0	2	2	
8	CSS 708	Seminar /Group discussion	-	-	-	-	30	30	0	0	2	2	Total Marks
		Total	350	100	50	140	160	800	15	5	14	34	800

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A UGC-Autonomous Institute affiliated to RGPV, Bhopal)

Scheme of Examination
B.E. (Computer Science & Engineering)
For batches admitted in July, 14 (to be implemented in July, 2017)
Semester – VIII

S.N.	Subject Code (New)	Subject Name & Title	Maximum Marks Allotted					Total Marks	Credits Allotted Subject wise			Total Credits	Remarks
			Theory Slot			Practical Slot							
			End Sem.	Mid Sem. Exam	Quiz, Assignment	End Sem	Term Work		L	T	P		
							Lab Work & Sessional						
1	CSL 801	Advance Operating Systems	70	20	10	30	20	150	3	1	2	6	
2	CSL 802	Data Warehouse and Data Mining	70	20	10	30	20	150	3	1	2	6	
3	CSL 803	Neural Networks & Fuzzy Systems	70	20	10	30	20	150	3	1	2	6	
4	CSL 804	Cellular and Mobile communication (Elective-II)	70	20	10	-	-	100	3	1	-	4	
5	CSD 805	Major Project - II	-	-	-	100	70	170	-	-	8	8	
6	CSS 806	Self Study (Internal Assessment)	-	-	-	-	30	30	-	-	2	2	
7	CSS 807	Seminar/ Group discussion	-	-	-	-	50	50	-	-	2	2	Total Marks
		Total	280	80	40	190	210	800	12	4	18	34	800

Department of Computer Science & Engineering and Information Technology

BASIC COMPUTER ENGINEERING
100203

L	T	P	C
4	1	2	6

COURSE OBJECTIVES

- To develop comprehensive knowledge about the fundamental principles and concepts of basic computer engineering.
- To develop competencies for the design, coding and debugging of computer programs.
- To understand fundamentals of operating system concept & database management system.
- To acquire the basic knowledge of computer networks and its application & internet technology.

UNIT-I FUNDAMENTAL OF COMPUTERS

Introduction, Von Neumann model, Evolution of Computers, Generation of Computers, Classification of Computers, Computing Concepts, Hardware, Software: types of software, Memory: Memory Representation, RAM, ROM, Storage Systems, Computer Codes: Decimal System, Binary System, Hexadecimal System, Octal System, Conversion of Numbers, Applications of Computers.

UNIT-II BASIC CONCEPTS OF PROGRAMMING

Introduction & History of Programming Languages, Generations of Programming Languages, Characteristics of a Good Programming Language, Categorization of Languages, Factors Affecting the Choice of a Language, Fundamentals of programming: Operators, data types, variables, expressions, , precedence & associativity, statements and control structure, types of errors, Program structure, array, functions, union, structure, pointers.

UNIT-III OPERATING SYSTEM CONCEPTS

Introduction, Functions of Operating System, Process Management, Memory management, File Management, Device Management, Security Management, Types of Operating System, Popular Operating Systems.

UNIT-IV DATABASE MANAGEMENT SYSTEM

File system organization, Introduction to DBMS, Data models, File oriented Vs Database Approach, Applications of DBMS, Architecture of Database management system, Data Independence, Data Dictionary, DBA, DBMS keys, Data Definition Language, Data manipulation Language.

UNIT-V COMPUTER NETWORKS & INTERNET TECHNOLOGY

Introduction, Data Communication, Computer Network, Internetworking device, Network Topologies, OSI model, WWW and Web browser, Internet Applications, basics of network security and E-commerce.


RECOMMENDED BOOKS:

- Fundamentals of computer Engineering-E. Balagurusamy, Tata McGraw Hill Education private Limited, second Edition.
- Basic computer Engineering-SumitaArora, DhanpatRai& Company.
- Operating System Concepts- Galvin Wiley
- Database system concepts- Korth, McGraw-Hill

COURSE OUTCOMES

Upon completion of the course, it is expected that student will be able to:

- CO1 • Have a thorough understanding of the fundamental concepts and techniques used in computer engineering.
- CO2 • Develop an understanding to design logical programs.
- CO3 • Describe the fundamental architecture and types of operating system, with process management and file management.
- CO4 • Analyze different approaches of maintaining data and understand the variation between them.
- CO5 • Recognize different computer networks and their design.
- CO6 • Develop basic understanding of Internet and E-commerce.
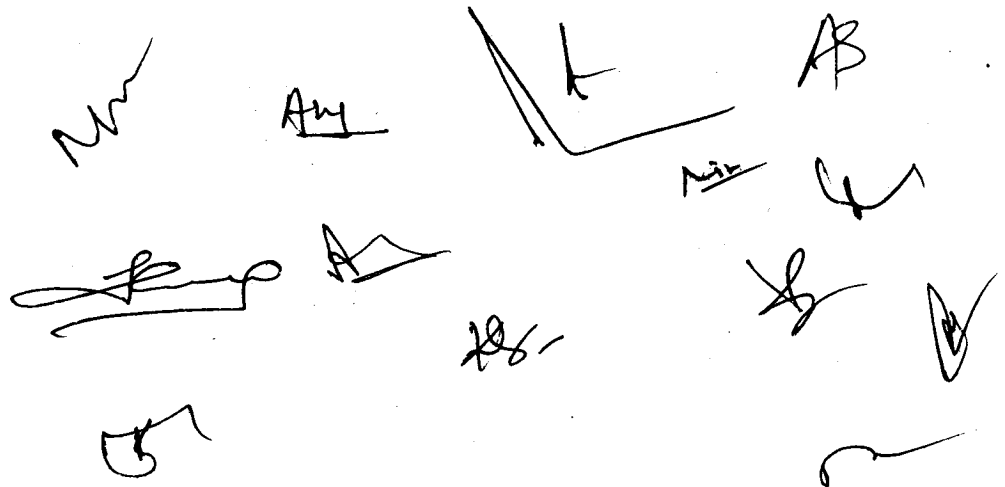
Department CSE&IT
BASIC COMPUTER ENGINEERING
(100203)
List of Experiments

1) Write a C program to enter two numbers and perform all arithmetic operations.
2) Write a C program to enter length in centimeter and convert it into meter and kilometer.
3) Write a C program to find maximum between three numbers.
4) Write a C program to check whether a number is divisible by 5 and 11 or not.
5) Write a C program to check whether an alphabet is vowel or consonant using switch case.
6) Write a C program to find maximum between three numbers using conditional/ternary operator.
7) Write a C program to check whether a character is uppercase or lowercase alphabet.
8) Write a C program to enter any number and print its reverse.
9) Write a C program to enter any number and check whether the number is palindrome or not.
10) Write a C program to enter any number and check whether it is Armstrong number or not.
11) Write a C program to convert Decimal to Hexadecimal number system.
12) Write a C program to count total number of duplicate elements in an array.
13) Write a C program to add and multiply matrix.
14) Write a C program to find total number of alphabets, digits or special character in a string.
15) Write a C program to check whether a given number is prime or not.
16) Write a C program to count No. of lines, characters, words in a given file.

Department of Computer Science & Engineering and Information Technology

DIGITAL ELECTRONICS

BCSL 302

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- The objective of this course is to learn the various number systems, Boolean algebra, logic gates and also familiar with various combinational circuits.
- Designing synchronous and asynchronous sequential circuits.

UNIT I

Introduction to Digital Electronics, Needs and Significance, Different Number System: Binary Numbers, Octal and Hexadecimal Numbers, Conversions, Complement's, Signed Binary Numbers, Binary Arithmetic's, Binary Codes: BCD, ASCII Codes.

UNIT II

Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Boolean Relations, Digital Logic Gates, De Morgan's Theorem, Karnaugh Maps and simplifications.

UNIT III

Combinational Circuits, Half Adder, Full Adder, Binary Adder-Subtractor. Binary Multiplier, Comparator, Decoders, Encoders, Multiplexers.

UNIT IV

Sequential Circuits, Latches, Flip-Flops: RS Latches, Level Clocking, D Latches, Edge-triggered D Flip-flop, Edge-triggered JK Flip-flop, JK Master-slave Flip-flop; Registers, Shift Registers, Counters, Ripple Counters, Synchronous Counters.

UNIT V

Memory: Different types of Memory, Memory Decoding, Error Detection and Correction. Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices, RTL and DTL Circuits, TTL, ECL, MOS. CMOS, Application Specific Integrated Circuits.

REFERENCE BOOKS:-

1. Morris Mano M. and Michael D. Ciletti, "Digital Design", IV Edition, Pearson Education.
2. Anil K. Maini, "Digital Electronics: Principles, Devices and Applications", Wiley.

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Acquire knowledge about solving problems related to number systems and Boolean algebra.
- Acquire knowledge about basics of digital circuit and systems.
- Identify and analyze combinational circuits.
- Understand various synchronous and asynchronous sequential circuits.
- Differentiate of various programmable logic array.
- Design Digital Circuit and System.

Department of CSE & IT
DIGITAL ELECTRONICS LAB MANUAL
(BITL 302)
List of Experiments

1. Logic gates: AND,OR,NOT,NOR,NAND,XOR

2. Arithmetic Circuit- construction and testing using 74xxICs
   a. Half adder and Full adder.
   b. Half subtractor and Full subtractor.

3. Combinational logic circuit design using 74xxICs.

4. Encoders and Decoders.

5. Multiplexer and Demultiplexer.

6. Study of Arithmetic Logic Unit(ALU) using IC 74181.

7. Construction of 1- bit comparator using 74xxICs and study of 4-bit comparator IC 7485.

8. code converters – Binary to gray and Gray to binary.

9. Verification of basic flip flops using 74xxICs and master- slave JK flip-flop using IC 7476

10. Asynchronous counter design and Mod-n counter.

11. 3-Bit synchronous counter design

12. Shift register- SIPO/SISO & PISO/PIPO.

Department of Computer Science & Engineering and Information Technology
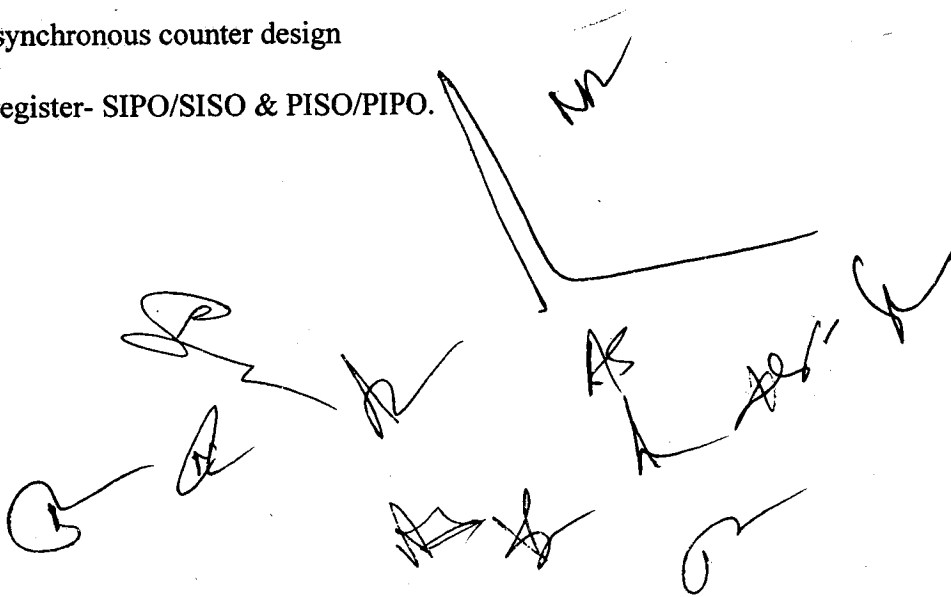
OBJECT ORIENTED PROGRAMMING AND METHODOLOGY
BCSL 303

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- Students should be able to study about the concept of object oriented programming.
- To create C++ program that leverage the object oriented features of the C++ Language, such as encapsulation, inheritance, polymorphism and use of data types, arrays and other data collections.
- Students should be able to program using more advanced C++ features such as
- Composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling, etc.
- Be able to apply object oriented or non-object oriented techniques to solve bigger computing problems (than the ones in COP3014).

UNIT-I   INTRODUCTION TO C++ AND OBJECT ORIENTED CONCEPTS:

C++ Basics, C++ Tokens, I/O Statements, Structure of C++ Program, Operators and Expressions, Flow of Control, Arrays, Structures, Functions, Type of Function ,Function Prototyping, I/O Functions.Pointers: Introduction, Pointer Variables, Pointers and Arrays, Array of Pointers, Pointers and Structures, Dynamic M/R Allocation.

Programming Techniques: Unstructured & Structured Programming, Object Oriented Paradigm, Features of Oops, Comparison with Procedural Oriented Programming & Object Oriented Programming, Abstract Data Types, Reference Variable, Scope Resolution Operator.

UNIT-II   CLASSES & OBJECTS:
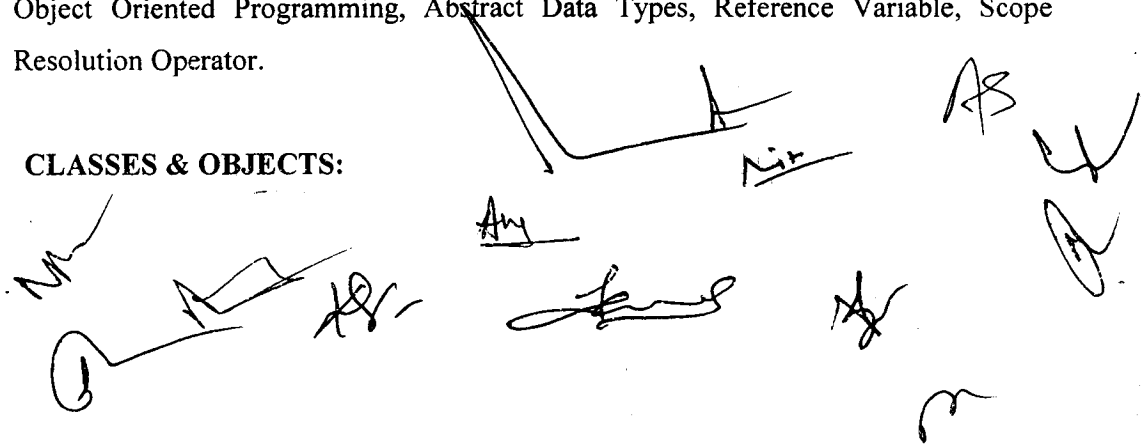
Specification of Class, Visibility Modes: Private, Public, Protected, Defining Member Functions, Creating of Objects, Characteristics of Object, Static Data Member, Static Member Function, Array of Objects, Object as Arguments, Inline Function, Default Arguments, Friend Function, Recursion.

Constructors and Destructors: Introduction, Types of Constructors- Default Constructor, User Defined Constructor, Parameterized Constructor, Copy Constructor, Constructor with Default Arguments, Rules of Constructor Definition and Usage, Destructors.

UNIT-III POLYMORPHISM:

Introduction, Type of Polymorphism: Compile Time Polymorphism & Run Time Polymorphism, Function Overloading & Operator Overloading, Binary Operators, Arithmetic Assignment Operators, Unary Operators, Rules for Operator Overloading, Pitfalls of Operator Overloading, Data Conversion, Type Casting.

UNIT-IV INHERITANCE:

Introduction to Code Reuse, Visibility Modes, Types of Inheritance: Single Level, Multilevel, Multiple, Hybrid, Multipath. Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Nesting of Classes, Overriding Member Function. Containership: Classes with in Classes, Function Overriding.

UNIT-V POINTERS & FILE CONCEPTS:

Pointers Overview, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions & Pure Virtual Function, Association, Type of Association, Aggregation, File Concepts, Study of Various Files and Streams, Opening and Closing of Files- Functions Get(), Getline(), Put(), Opening The Files Using Function Open(),File Manipulator Function.

RECOMMENDED BOOKS

1. C++ How to Program by H M Deitel and P J Deitel, Prentice Hall.
2. Programming with C++ By D Ravichandran, T.M.H.
3. Computing Concepts with C++ Essentials by Horstmann, John Wiley.
4. The Complete Reference in C++ By Herbert Schildt, TMH.

5. Object-Oriented Programming in C++ by E Balagurusam.

6. Fundamentals of Programming C++ by Richard L. Halterman.
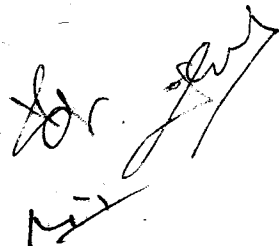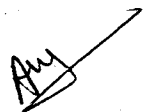

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Understand concepts of objects and their significance in real world
- Understand abstract classes significance
- Develop data flow diagrams and flow charts for small/ moderate problems.
- Design and write the program based on oops concepts.
- Analyzes real word problem based on object oriented programming.
- Develop software in terms of objects, associations and integrity constraints

---
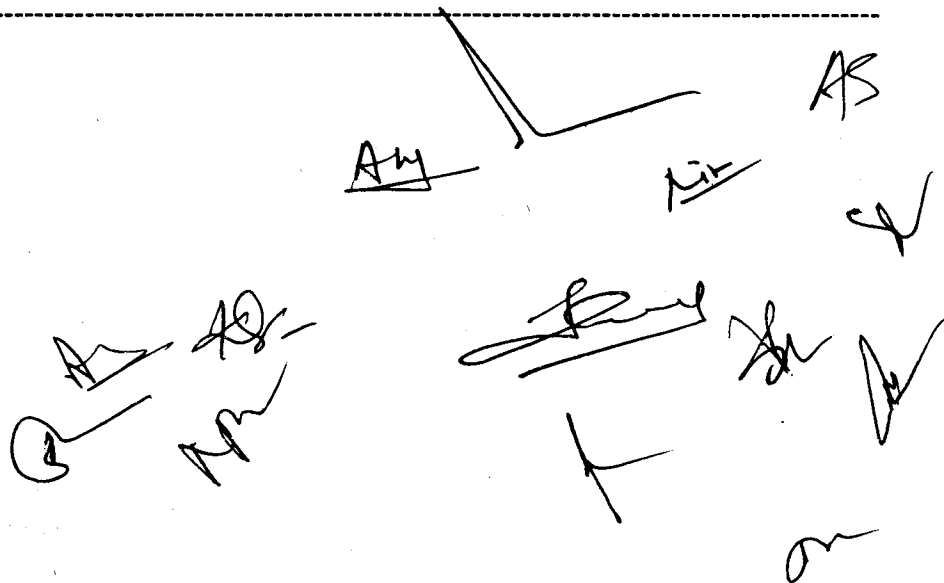
Department of Computer Science & Engineering and Information Technology
OOP'S METHODOLOGY
BCSL 303
List of Experiments

1) Write a Class for entering name & age of the person & displaying same using function.

2) Write a Program for counting the number of object created using static data member

3) Write a class which contains one friend function

4) Write a program which contains different type of constructor &destructor

5) Write a program for single inheritence

6) Write a Program for Multiple Inheritance

7) Write a Program for Hierarchicalinheritance

8) Write a Program for MultilevelInheritance

9) Write a Program for inheriting base class constructor through derived class constructor

10) Write a program for implementing virtual function

11) Write a Program for inheriting base class constructor through derived class Constructor

12) Design a complete program in C++ to overload Complex numbers from two different class and display the sum using a common friend function two classes.

13) Create a class FlOT1 that contain some Float data number. Overload all the four arithmetic operators, so that they operates on the object of FLOT1

14) Define a Class string. Use overload === operator to compare two string

15) Write a program for overloading different arithmetic operators like +(addition), - (subtraction), *Multiplication/ Division.

16 Write a Program for Overloading function named Draw () to Draw

a) Circle
b) Rectangle
c) Triangle

17) Write a Program to Implement Inline function

18) Write a Program which takes object as a argument.

Department of Computer Science & Engineering and Information Technology

COMPUTER GRAPHICS

BCSL304

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- To provide an introduction to the theory and practice of computer graphics.
- To give a good exposure related to Computer Graphics algorithms and to design various graphics primitives.
- To enhance the proficiency in programming skills related to animation and graphics object design
- To apply the mathematical concepts in designing and executing the object transformation and projection.
- To enhance the familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication in graphics perspective.

UNIT-I Introduction to Computer Graphics, Interactive Computer Graphics, Application of Computer Graphics, Random and Raster Scan Displays, Storage Tube Graphics Display, Calligraphic Refresh Graphics Display, Flat Panel Display, Refreshing, Flickering, Interlacing, Resolution, Bit Depth, Aspect Ratio etc.

UNIT-II Scan Conversion Technique, Image representation, Line drawing: DDA, Bresenham's Algorithm. Circle Drawing: General Method, Mid-Point, DDA, Bresenham's Circle Generation Algorithm, Ellipse Generation Algorithm, Curves: Parametric Function, Bezier Method, B-Spline Method.

UNIT-III 2D & 3D Transformations: Translation, Rotation, Scaling, Reflection, Shearing, Inverse Transformation, Composite Transformation, World Coordinate System, Viewing Transformation, Representation of 3D object on Screen, Parallel and Perspective Projections.

UNIT-IV Clipping: Point clipping, Line Clipping, Simple Visibility Line Clipping Algorithm, Cohen Sutherland Line Clipping Algorithm etc, Polygon Clipping, Convex and Concave Polygon, Sutherland Hodgeman Polygon Clipping Algorithm etc, Area Filling, Hidden Surface Elimination: Z- Buffer algorithm and Painter's Algorithm.

UNIT-V Basic Illumination Models: Diffuse Reflection, Specular Reflection, Phong Shading, Gouraud Shading, Color Models like RGB, YIQ, CMY, HSV etc., Introduction to Digital Image Processing (DIP), Fundamental Steps and Components of DIP.

RECOMMENDED BOOKS

1 .Donald Hearn and M.P. Becker: Computer Graphics, PHI Publication

2. FoleyVandam, Feiner, Hughes: Computer Graphics principle and Practice

3. Rogers:Principles of Computers Graphics, TMH

4. Sinha and Udai: Computer Graphics, TMH

5. Digital Image Processing by Gonzalez.

COURSE OUTCOMES

- Understand the basic concept of Computer Graphics.
- Understand various algorithms for scan conversion.
- Analyse geometric transformations of graphics objects.
- Analyse projections and visible surface detection techniques.
- Develop different clipping methods and its transformation.
- Apply mathematical formulations, algorithmic principles, programming, different graphics systems and applications of computer graphics.

Department of CSE & IT
Computer Graphics & Multimedia
(BCSL304)
List of Experiments

1. Write a program for simple DDA line generation

2. Write a Program for symmetrical DDA line generation

3. Write a program for Bresenham's line generation

4. Write a program for DDA Circle drawing

5. Write a program for mid point circle drawing

6. Write a program for simple visibility lie clipping

7. Write a program for Cohn-Sutherlad line clipping algo.

8. Write a program for Polygon clipping Sutherland Hodgeman.

9. Write a program for parallel & Perspective Projection

10. Write a program for different types of transformation.

Department of Computer Science & Engineering and Information Technology
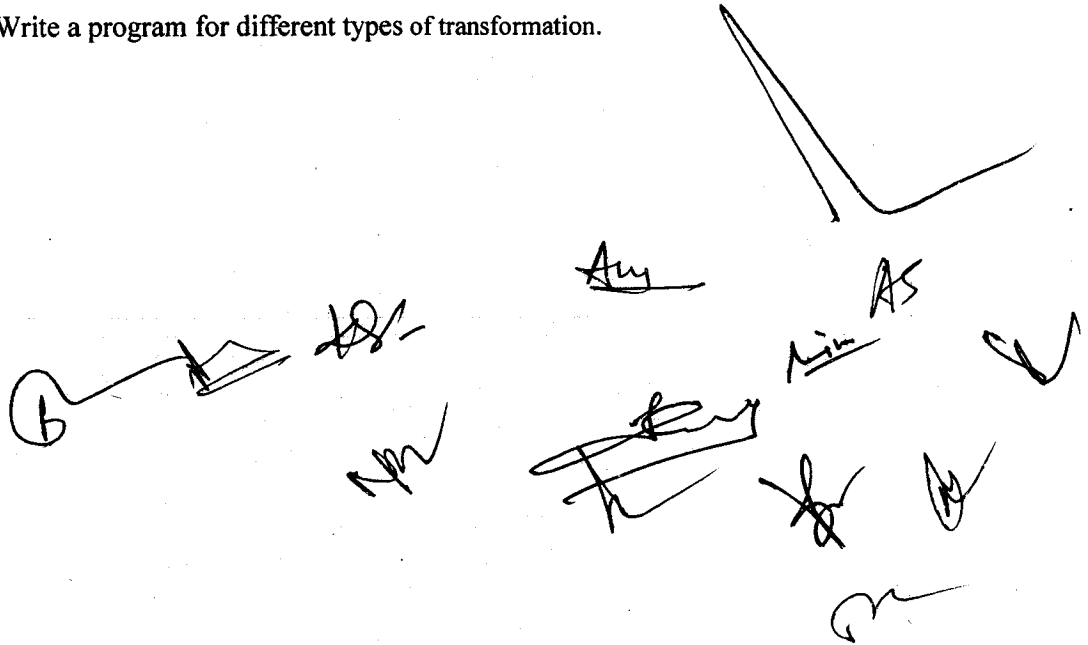
OPERATING SYSTEM

BCSL 305

L	T	P	C
3	1	-	4

COURSE OBJECTIVE

To study and apply concepts relating to operating systems, such as concurrency and control of asynchronous processes, deadlocks, memory management, processor and disk scheduling, parallel processing, and file system organization

----

UNIT-I **OPERATING SYSTEMS OVERVIEW:** Operating System Functions, Overview of Computer Operating Systems, Protection and Security, Distributed Systems, Special Purpose Systems, Operating System Structures, Operating System Services and System Calls, System Programs, Operating System Generation.

PROCESS MANAGEMENT: Process Concepts, Threads, Scheduling-Criteria, Algorithms and their Evaluation, Thread Scheduling, Case Studies: UNIX, Linux and Windows.

UNIT-II **CONCURRENCY:** Process Synchronization, The Critical-Section Problem. Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions, Case Studies: UNIX, Linux and Windows.

PRINCIPLES OF DEADLOCK: System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock.

UNIT-III **MEMORY MANAGEMENT:** Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation, Virtual Memory, Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing, Case Studies: UNIX, Linux and Windows.

UNIT-IV FILE SYSTEM INTERFACE: The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Case Studies: UNIX, Linux and Windows.

Mass-Storage Structure: Overview, Disk Structure, Disk Attachment, Disk Scheduling, Swap-Space Management, Raid Structure, Stable-Storage Implementation, Tertiary Storage Structure.

UNIT-V I/O SYSTEMS: Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Requests to Hardware Operations.

PROTECTION: Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability- Based Systems and Language - Based Protection.

SECURITY: The Security Problem, Program Threats, System and Network Threats, Cryptography as a Security Tool, User Authentication, Implementing Security Defences, Fire Walling to Protect Systems and Networks, Computer Security Classifications, Case Studies: UNIX, Linux and Windows.

RECOMMENDED BOOKS

1. "Operating System Concepts", Silberschatz, Willey Publication.

2. "Operating System Principles, Design & Applications", Stuart, Cengage Learning.

3. "Modern Operating Systems", Tannanbaum, PHI Learning.

COURSE OUTCOMES

- Understand basic concept of operating systems.
- Understand types of operating system and their properties.
- Understand design issues associated with operating systems.
- Develop the application of operating system.
- Analyze various scheduling, synchronization methods.
- Analyze the concepts of memory management.

Department of Computer Science & Engineering and Information Technology

HARDWARE LAB
BCSP-306

L	T	P	C
-	-	4	2

COURSE OBJECTIVES

- To introduce students to the installation, configuration, optimization and upgrading of computer systems; and
- To introduce students to troubleshooting and maintaining the computer system; and
- To provide students with opportunities to develop basic techniques with respect the hardware of a computer system.

UNIT-I STUDY OF HARDWARE: Introduction, Motherboard, Types of Motherboard, Integrated Motherboards, Non-Integrated Motherboards, Desktop Motherboards, Server Motherboards, Laptop Motherboards, Factors of Motherboard, Components of a Motherboard, Manufacturers of Motherboards, Bus Architecture.

UNIT-II MEMORY: Introduction, Types of Memory, Primary Memory, Secondary Memory, Installation and Partition of Hard Disk, Working of Hard Disk.

UNIT-III STUDY OF INPUT OUTPUT DEVICES: Basics of I/O Devices, Introduction to Ports, Identify the Different Ports, Ports Troubleshooting.

UNIT-IV SMPS (SWITCH MODE POWER SUPPLY): Basic Concept of Power Supply Unit, Types of Power Supply, AT Power Supply, ATX Power Supply, Troubleshooting, Windows Installation: Windows XP, Windows 7, Windows 8, Server 2003, PC Assembling.

UNIT-V NETWORKING: Introduction, Types of Network, Topology, State Cabling, Cross Cabling, Switching Devices, Networking Tools, IP Addressing, Peer To Peer Networking.

RECOMMENDED BOOKS

1. Comdex Hardware and Networking Course Kit: Vikas Gupta
2. The Indispensable PC Hardware Book, Third Edition: Hans-Peter Messmer
3. Data Communications and Networking, Fourth Edition: Behrouz A. Forouzan

---

COURSE OUTCOMES

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

- Understand the basic concept of hardware peripherals.

- Identify the components, slots, sockets, and connectors of motherboards.

- Describe the different type of memory and their uses.

- Identify I/O devices, port, and power supply issue.

- Identify the cables and connectors involved in computer networking.

- Install and configure Windows and Linux operating systems.
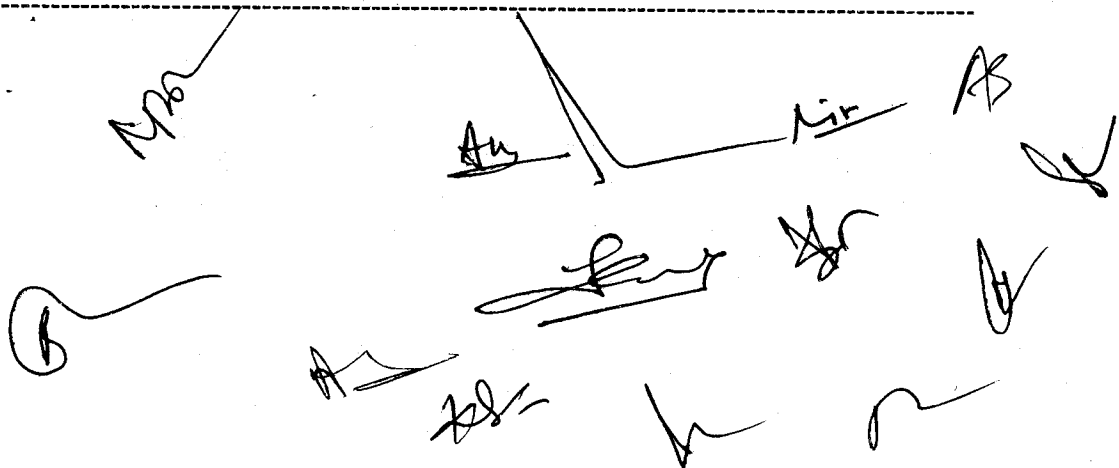
Department of CSE & IT
HARDWARE LAB
BCSL 306
List of Experiments

1. Study of Motherboards.
2. Study of Memory.
3. Study of Hard Disk Drive.
4. Study of Keyboard And Mouse
5. Study of Microprocessor
6. Study of CDROM & DVD R/W
7. Study of SMPS
8. Study of Assembling Pc
9. Study of Computer Networks
10. Study of IP Addressing
11. Study of Wireless Network
12. Study of LAN Cable & Type
13. Installation of Windows 2007

Department of Computer Science & Engineering and Information Technology

DESIGN & ANALYSIS OF ALGORITHMS

BCSL 402

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- To introduce the topic of algorithms as a precise mathematical concept
- To study how to design algorithms, establish their correctness, their efficiency and memory needs.
- To cover the techniques like recursion, divide and conquer, dynamic programming, greedy approach, and Backtracking.
- To make Students to practice their skills on many well-known algorithms and data structures designed to solve real-life problems.

UNIT-I Introduction to Algorithms and its Importance, RAM Model, Recurrences and Asymptotic Notations, Mathematical Analysis of Non-Recursive and Recursive Algorithm, Review of Sorting & Searching Algorithms, Basic Tree and Graph Concepts: Binary Search Trees, Height Balanced Trees, B-Trees and Traversal Techniques.

UNIT-II Divide and Conquer Method: Introduction and its Examples such as Finding the Maximum and Minimum, Binary Search, Merge Sort, Quick Sort and Strassen's Matrix Multiplication.

UNIT-III Greedy Method: Introduction, Characteristics, Examples of Greedy Methods such as Single-Source Shortest Paths, Optimal Merge Patterns, Huffman Coding, Minimum Cost Spanning Trees (Prims's and Kruskal's Algorithm), Knapsack Problem, Job Sequencing with Deadlines and Optimal Storage on Tapes.

UNIT-IV Dynamic Programming: Introduction, The Principle of Optimality, Examples of Dynamic Programming Methods such as – 0/1 Knapsack, All Pairs Shortest Path, Longest Common Subsequence and Reliability Design.

UNIT-V Backtracking: Concept and its Examples like 8-Queen's Problem, Hamiltonian Circuit Problem, Graph Coloring Problem etc. Branch & Bound: Introduction and its Examples like - Traveling Salesperson Problem etc. NP-Completeness: Introduction, The Class P and NP, Polynomial Reduction, NP-Hard and NP- Complete Problems.

RECOMMENDED BOOKS

1. Horowitz & Sahani; Fundamentals of Computer Algorithms; Universities press.
2. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
3. Ullmann; Design & Analysis of Computer Algorithms; Pearson.
4. Michael T Goodrich, Robarto Tamassia, Algorithm Design; Wiley India.

COURSE OUTCOMES

- Understand the basic property of the algorithm.
- Understand the complexity of the algorithm.
- Understand algorithms for a number of important computational problems like sorting, searching, and graphs etc.
- Apply mathematical preliminaries to analyze and design stages of different types of algorithms.
- Analyze and compare complexity for different types of algorithms for various types of problems.
- Recognize the general principles and good algorithm design techniques for developing efficient computer algorithms.

Department of CSE & IT
Design & Analysis of Algorithms
(BCSL-402)
List of Experiments

1. Implementation and Time analysis of sorting algorithms.

Bubble sort, Selection sort, Insertion sort, Merge sort and Quicksort

2. Implementation and Time analysis of linear and binary search algorithm

3. Implementation of max-heap sort algorithm

4. Implementation and Time analysis of factorial program using iterative and recursive method

5. Implementation of a knapsack problem using dynamic programming.

6. Implementation of chain matrix multiplication using dynamic programming.

7. Implementation of making a change problem using dynamic programming

8. Implementation of a knapsack problem using greedy algorithm

9. Implementation of Graph and Searching (DFS and BFS)

10. Implement prim's algorithm

11. Implement kruskal's algorithm.

12. Implement LCS problem

Department of Computer Science & Engineering and Information Technology

DATABASE MANAGEMENT SYSTEM
BCSL 403

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- To understand the different issues involved in the design and implementation of a database system.

- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models

- To understand and use data manipulation language to query, update, and manage a database

- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.

- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

UNIT I DBMS Concepts & Architecture, Introduction of File organization Techniques, Database Approach v/s Traditional File Approach, Advantages of Database System, Schemas, Instances, Data Independence, Functions of DBA, Entities & Attributes, Entity types, Value Sets, Key Attributes, Relationships, E-R Diagram, Data Models: Hierarchical Data Model, Network Data Model & Relational Data Model, Comparison between Models.

UNIT II **RELATIONAL DATA MODELS:** Domains, Tuples, Attributes, Relations, Characteristics of Relations, Keys, Attributes of Relation, Relational Database, Integrity Constraints, Query

Languages: Relational Algebra & Relational Calculus, Relational Algebra operations like Select, Project, Join, Division, Union etc.

UNIT III SQL: Data Definition & Data Manipulation commands in SQL, Update Statements & Views in SQL Query & Subquery, QUEL & QBE Data Storage definition, Data Retrieval Queries & Data Manipulation Statements etc. Overview of Tuple Oriented & Domain Oriented Relational Calculus & Operations.

UNIT IV DATABASE DESIGN: Introduction to Normalization, Various Normal Forms: 1NF, 2NF, 3NF, BCNF, Functional Dependency, Decomposition, Dependency Preservation, Loss Less & Lossy Join, Problems with Null Valued & Dangling Tuple, Multivalue Dependencies, Overview of Distributed Databases, Protection, Security & Integrity Constraints.

UNIT V Transaction Processing Concepts, State Diagram, Types of Transaction, Concurrency Control, Concurrent operation of Databases, Recovery, Types of Recovery, Basic Concepts of Object Oriented Database System & Design.
Case Study of Relational Database Management Systems: Oracle & Microsoft Access Tools.

RECOMMENDED BOOKS

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw-Hill, 6th Edition.
2. Raghu Ramakrishnan, Johannes Gehrke,"Database Management System", McGraw Hill., 3rd Edition.
3. Elmasri & Navathe, "Fundamentals of Database System", Addison-Wesley Publishing, 5th Edition.
4. Date C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition.

COURSE OUTCOMES

After successful completion of the course students will be able to:
- Understand the basic concepts of DBMS.
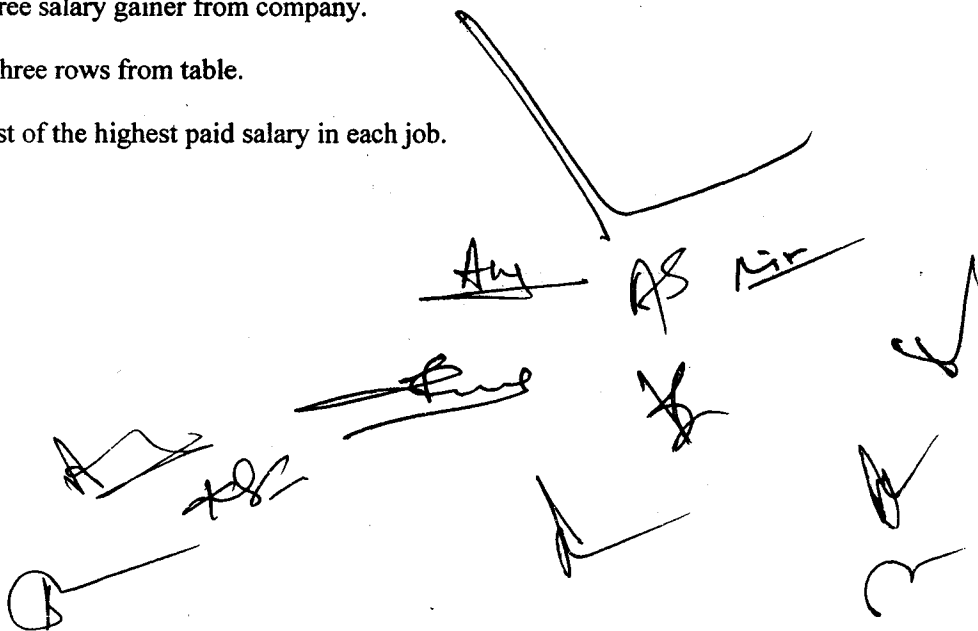
- Understand the Architecture of DBMS.
- Design database schema for a given problem domain.
- Write complex queries including full outer joins, self- joins sub-queries.
- Normalize a database, populate and query a database using SQL DML/DDL commands.
- Apply knowledge of DBMS to core Computer Science Engineering/Information Technology Problems in industry and research fields.

Department of CSE & IT
Data Base Management System
(BCSL-403)
List of Experiments

1. Create Data Base using MYSQL.

2. Create a table which has records of employee.

3. Insert some records in employee table.

4. Delete duplicate row from table.

5. Display the employee name which is start with J, K, L or M.

6. Find the third highest paid & third lowest paid salary.

7. Display all employees who are hired at the first half of December 2003.

8. Update multiple rows from table.

9. Display top three salary gainer from company.

10. Display first three rows from table.

11. Retrieved a list of the highest paid salary in each job.

Department of Computer Science & Engineering and Information Technology

COMPUTER NETWORKS
BCSL 404

L	T	P	C
2	1	2	4

COURSE OBJECTIVES

- To become familiar with layered communication architectures (OSI and TCP/IP).
- To understand the client/server model and key application layer protocols.
- To understand the concepts of reliable data transfer and how TCP implements these concepts.
- To learn the principles of routing and the semantics and syntax of IP.
- To understand the basics of error detection including parity, checksums, and CRC.
- To familiarize the student with current topics such as security, network management, sensor networks, and/or other topics.

UNIT-I INTRODUCTION: Protocol Architecture- TCP/IP Protocol Architecture ,OSI Model, ATM Model, System Network Architecture, Transmission Media- Guided and Unguided Transmission Media, Data Representation, Data Transmission, Modes of Data Transmission, Digital Signal Encoding, Switching Techniques-Circuit Switching, Message Switching and Packet Switching, RS 232C, Modem, Topologies and Internetworking Devices.

UNIT-II DATA LINK LAYER: Error Detection and Correction, Framing, Flow and Error Control, BSC, HDLC, Multiple Access, Random Access, Controlled Access and Channelization. Multiple Access Protocols: ALOHA, CSMA, CSMA/CA, CSMA/CD, Collision Free

Protocols, Limited Contention Protocols, Ethernet, Traditional Ethernet, IEEE Standards 802.3, 802.4 and 802.5.

UNIT-III NETWORK LAYER : IP addressing , Routing- Datagram and Virtual Circuits, Routing Algorithms: Static Routing Algorithms, Dynamic Routing Algorithms, Hierarchical Routing, Broadcast Routing and Multicast Routing, Congestion Control and Quality of Service.

UNIT-IV TRANSPORT LAYER: Overview, User Datagram Protocol, Transmission Control Protocol: Connection Management, Flow Control, Error Control and Congestion Control.

UNIT-V APPLICATION LAYER: Application Layer Protocols like: FTP, Remote Login, Virtual Terminal, SMTP, POP3, IMAP, MIME and HTTP.

RECOMMENDED BOOKS

1. Data and Computer Communication, W. Stallings, Pearson,
   Internetworking with TCP/IP, Vol–I, D.E. Comer, PHI.
2. Data Communication & Networking, B.A. Forouzan, McGraw-Hill.
3. ISDN and Broadband ISDN with Frame Relay and ATM, W. Stalling.

COURSE OUTCOMES

- Understand the basic concept of computer network.
- Understand the different types of network topologies and protocols.
- Understand and building the skills of sub netting and various routing techniques.
- Explain the different types of network devices and their functions within a network.
- Describe the Security issues in data transfer in network.
- Analyze the network environment with all the necessary data communication components, procedure and techniques that make it functional.

Department of CSE & IT
Computer Networks
(BCSL-404)
List of Experiments

1. Introduction to twisted-Pair Cable, UTP Cable, Shielded Twisted-Pair Cable, Coaxial Cable

2. Introduction to Network devices Switch, Router

3. Configure a Wireless Router as Bridge

4. Implementation of the Data Link Layer framing method such as character stuffing and Bit stuffing.

5. Implementation of CRC algorithm.

6. Implementation of a Hamming (7,4) code to limit the noise. We have to code the 4 bit Data in to 7 bit data by adding 3 parity bits.

7. Write a program to encrypt 64-bit text using DES algorithm.

8. Implementation of routing algorithms.

Department of Computer Science & Engineering and Information Technology

COMPUTER SYSTEM ORGANIZATION

BCSL 405

L	T	P	C
3	1	-	4

COURSE OBJECTIVE

The objective of this course is to provide the fundamental knowledge of a modern computer system and its processing units. It also provides the details of input & output operations, memory management and performance measurement operations of the computer system.

UNIT I INTRODUCTION: Von Newman Model, Various Subsystems, CPU, Memory, I/O, System Bus, CPU and Memory Registers, Program Counter, Accumulator, Register Transfer and Micro Operations: Register Transfer Language, Register Transfer, Tree-State Bus Buffers, Bus and Memory Transfers, Arithmetic Micro-Operation, Logic Micro-Operation, Shift Micro-Operation Register Transfer Micro Operations, Arithmetic Micro-Operations, Logic Micro-Operations and Shift Micro-Operations.

UNIT II COMPUTER ARITHMETIC: Addition and Subtraction with Signed-Magnitude, Multiplication Algorithm, Division Algorithm, Division Algorithms, Floating-Point Arithmetic Operations.

CENTRAL PROCESSING UNIT (CPU): General Purpose Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC).Hardwired and Microprogrammed Control.

UNIT III MICROPROCESSORS: Introduction of 8085 Microprocessor: Architecture, Instruction Set, Addressing Modes, Interrupts and Basic Assembly Language Programming.

UNIT IV INPUT-OUTPUT ORGANIZATION: Peripheral Devices, I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA (DMA Controller, DMA Transfer), Input-Output Processor (IOP), Data Transfer- Serial/Parallel, Simplex/ Half Duplex/ Full Duplex.

UNIT V MEMORY ORGANIZATION: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory- Organization and Mappings, Virtual Memory, Memory Management Hardware, Introduction to Multiprocessors.

RECOMMENDED BOOKS

1. Morris Mano: "Computer System Architecture", PHI.
2. Gaonkar: "Microprocessor Architecture, Programming and Applications with the 8085", Penram International Publishing (India) Pvt.Ltd.
3. Carl Hamacher: "Computer Organization", THM
4. J P Hayes: "Computer Architecture and Organization", Mc-Graw Hills, New Delhi

----

COURSE OUTCOMES

After completion of the course students should able to:

- Understand the basic concept of computer system organization.
- Understand the arithmetic operations of positive and negative numbers.
- Perform the arithmetic operations.
- Calculate the effective address of an operand by addressing modes.
- Analyze input-output organization.
- Analyze the cache mapping occurs in computer and can solve various problems related to this.

Department of Computer Science & Engineering and Information Technology

UNIX & LINUX LAB
BCSP 406

L	T	P	C
-	-	4	2

COURSE OBJECTIVE

The objective of this course is to familiarize students with the Linux environment and to learn the fundamentals of shell scripting/programming. It also familiarizes students with basic Linux administration work & learns networking with Telnet and FTP.

UNIT-I   UNIX Overview, UNIX Features, Kernel, Shell, File System, Directory System, Login Directory, Inode-User Identification, Permission Bits, File Sharing.

UNIT-II   Scheduling, Interprocess Communication, Unix Signal, Pipes and Filters, Timers, Memory Management, Swapping in Real –Storage UNIX Systems, Address Mapping in a Virtual Storage UNIX System, Paging, Swapping in Virtual Storage UNDC Systems, Dynamic Storage Allocation.

UNIT-III Working with C-UNIX, System Calls and UNIX Library Functions, UNIX-C Interface, Working with UNIX C Files and Graphics, UNIX Program Development and Applications, UNIX Tools.

UNIT-IV LINUX Overview and Features, Hardware Requirements, Hard Drive Partitioning, Red Hat Installation, Understating System Administration, Booting and Shutting Down, Managing User Accounts, Data Backup, Managing and Upgrading the File and Directory System, Working with Linux, Multiple Processes Management in Linux Shell Using vi Editor and Emacs Editor.

UNIT-V Accessing the Network with Telnet and FTP, Surfing the Internet with World Wide Web, Using Electronic Mail, Usenet News, Setting Up a Web Site, Working with Apache, Managing an Internet Web Server.

RECOMMENDED BOOKS

1. UNIX Concepts and Applications Sumitabha Das Mcgraw Hill Education (India) Private Limited.
2. Unix: The Complete Reference, By Kenneth Rosen,Douglas Host ,Rachel Klee, Richard Rosinski, Second Edition Mcgraw-Hill Education.
3. Advanced UNIX: A Programmers Guide – Stephen Prata, The Wait Group, Sams Pub.
4. Using Linux – The Most Complete Reference, 3rd Edition Que Pub / Jack Trackett Jr. and David Gunter.

COURSE OUTCOMES

After completion of the course students will be able to:

- Understand the basics concepts of UNIX & Linux environment.
- Install the UNIX and Linux Environment.
- Familiar with the fundamental commands of UNIX and Linux.
- Write shell scripts to automate various tasks.
- Design Application Programs.
- Do various tasks of Linux administration.

Department of CSE & IT
UNIX Lab
(BCSL-406)
List of Experiments

1. General Purpose commands:

    Date, who, who am I, uname,echo, printf, bc, script, passwd ,finger

2. File Handling utilities:

    Directory related commands: pwd,mkdir,cd,rmdir,ls

3 File related commands:

    Cat, cp, mv, rm, chmod, chown, chgrp, file,

4 File related commands continue:

5 find, ln, ulink, ulimit,umask,touch

6. Filters:

    cat, head, tail, cut, paste, cmp, comm, diff, sort, more, less, pg, tr, uniq   etc.

7. Introductions to Shell Programming Basics

8. Write a shell program to find out reverse string of the given string and check the given string

   is palindrome or not

9. Write a shell program to find out factorial of the given number.

10. Write a shell script to find out whether the given number is prime number or not.

Department of Computer Science & Engineering and Information Technology

NETWORKING WITH TCP/IP

BCSL 502

Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To build an understanding of the fundamental concepts of TCP/IP with computer networking.
- To familiarize the student with the basic taxonomy and terminology of the TCP/IP area.
- To analyze of Concepts of fundamental protocols
- To understand the network traffic, congestion, controlling and resource allocation.

UNIT - I   Introduction, Review of Network Protocols & Architecture. ISDN – ISDN, BISDN & ATM. ATM Switching. CELL relay and Frame relay, SONET & SDH LAN – Access and throughput analysis of LAN's Fast LAN's and Wireless LAN's Interconnecting LAN's ARPANET.

UNIT - II   Internet Working – Repeaters, Routers, Gateways, Connection Oriented & Connection Less Internet Working, Internet Addresses. IP, IPV4, IPV6, Routing of IP datagram. ICMP, CIDR. Mapping Address to Physical Address. Internet (ARP) and RARP.

UNIT - III   TCP and UDP :- TCP :- Reliable data transfer, Connection Establishment & Release. TCP Frame, Header Checksum, Sliding Window Concept for error control. UDP :- Format, Pseudo header, Encapsulation, Checksum, Multiplexing &Demultiplexing.

UNIT - IV TCP/IP over ATM, Server Model, DNS, FTP, TELNET.

UNIT-V Internet Applications & Security – Remote Login, SMTP, Internet security & Firewalls. Future of TCP/IP. IPV4 & IPV6 Security, HTTP.

RECOMMENDED BOOKS

- Data and Computer Communication - W. Stalling, Pearson
- Internetworking with TCP/IP - Vol.-I - D.E. Comer, PHI
- Data Communication & Networking -B.A. Forouzan
- ISDN and Broad band ISDN with Frame Relay & ATM - W. Stalling
- LANs - Keiser

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Identify the different types of network devices and their functions within a network
- Understand and building the skills of subnetting and routing mechanisms.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

- List and classify network services, protocols and architectures, explain why they are Layered. Choose key Internet applications and their protocols, and apply to develop their own applications (e.g. Client Server applications, Web Services) using the sockets API.
- Explain various congestion control techniques.

Department of Computer Science & Engineering and Information Technology

SOFTWARE ENGINEERING
BCSL 503

L	T	P	C
3	1	2	5

COURSE OBJECTIVES

- To understand the concept and principle of Software Engineering approaches.
- To understand the various methodologies for Software Development.
- To gain understanding of testing techniques in Software Engineering Environment.
- To develop ability for applying various tools and Technologies in the real-world problems.

UNIT - I   **Introduction to Software Engineering:**

Definition, software engineering-layered Technology, Software Characteristics and Components,**Software model:** Software Development of Life Cycle Model (SDLC), The Waterfall Model,Iterative Waterfall Model,Prototyping Model , Spiral Model, RAD Model. **Selection criteria ofmodel:** Characteristics of Requirements, Status of Development Team, Users participation, Typeof Project and Associated Risk.

UNIT - II   **Requirement Engineering:**

Definition, Requirement Engineering Activity , **Types of Requirement-** Functional and Non-functional Requirements, User and System Requirements, Requirement Elicitation Methods, Requirement Analysis Methods, Requirement Documentation (SRS), Requirement Validation, Requirement Management.

UNIT - III   **Design Concept, Principle and Methods:**

Design Fundamentals, Design Principles, Effective Modular Design, Design Representations, Architectural design, Procedural design, data Directed design, Real Time Design, Object Oriented Design, Coupling and Cohesion

UNIT - IV   **Software Metrics, Project Management and Estimation:**

Metrics in Process and Project domains, Software Measurement, Software Quality Metrics, **Project Management**- Basics-People,Product, Process, Project, **Estimation**- Software Project Estimation, Decomposition Techniques- Function Point Estimation, Line of Code (LOC) based estimation, Empirical Estimation, COCOMO Model, Project Scheduling Techniques

UNIT - V   **Software Testing:**

Definitions, Software Testing Life Cycle (STLC), , Test Case Design, Strategic Approach to Software Testing- Verification & Validation , Strategic issues, Criteria for completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Black Box Testing Techniques, White Box Testing Techniques, Acceptance Testing

RECOMMENDED BOOKS

- Software Engineering by Sommerville, Pearson
- Software Engineering, A Practitioner's Approch, by Roger S. Pressman, McGrawHill
- Software Engineering by K.K. Agrawal&Yogeshsingh, New age Publication
- Software Engineering byRajib Mall

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Design and mapping of different real world problems using software engineering concepts
- Evaluate software models with respect to their accuracy and needs of the customer requirement.
- Evaluate the technique and results with customer expectations.
- Identify and how to use various cost estimation techniques used in software engineering.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to use the techniques, skills, and software engineering tools necessary for engineering domain.

Department of CSE&IT
Software Engineering
BCSL-503
List of Experiments

1.   Project selection and planning.

  a. Analyze given system
  b. Develop the system
  c. Deliver the system.

2.   Create the software requirement specification (SRS) document.
3.   Software development model
4.   Introduction to UML and use case diagram.
5.   System modeling
6.   Estimate the cost of project using software project planning
7.   User interface design.
8.   UML Diagram.
9.   Create the documents for different types of testing.
10.   Technical metrics for software.

Department of Computer Science & Engineering and Information Technology
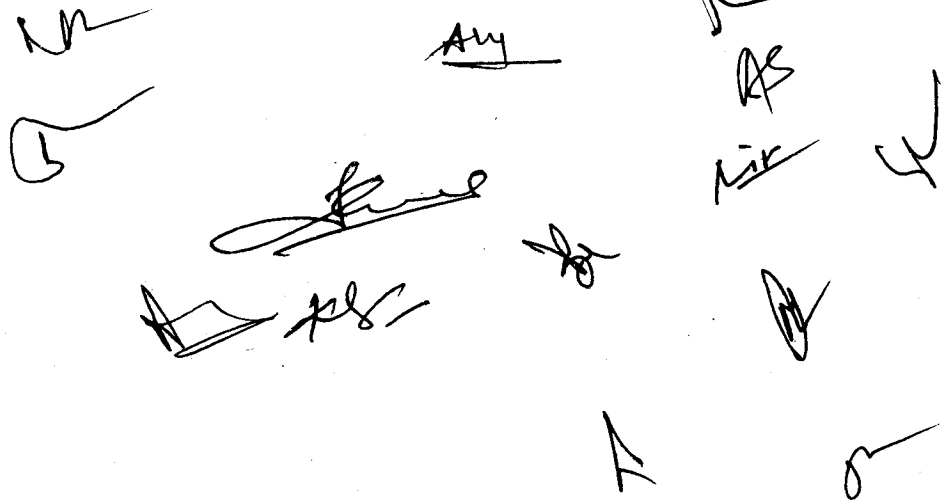
MICROPROCESSOR AND INTERFACING
BCSL504

L	T	P	C
3	1	2	5

COURSE OBJECTIVES

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
- To understand RISC and CISC based microprocessors.
- To understand concept of multi core processors.

UNIT - I Salient features of advanced microprocessors. RISC & CISC processors. Review of evolution of advanced microprocessors: 8086 8088 186 / 286 / 386 / 486Pentium. Super scalar architecture of Pentium, Architecture of Intel 8086 /Motorola 68000 and assembly language programming with inter 8086microprocessors.

UNIT – II Introduction to the various interfacing chips like 8212, 8155, 8255, 8755, andinterfacing Keyboards, Printers, LEDS, motors, ADC, DAC, and stepper motorsand introduction to programmable keyboard / Display interface, memory interfacing.

UNIT - III General-purpose programmable peripheral devices (8253) 8254 Programmable interval timer, 8259A programmable interrupt controller & 8257 DMA controllers.

UNIT - IV Serial I/O & Data Communication: use RS 232C, Modem etc. and various busstandards.

UNIT – V Introduction to micro controller 8051, its architecture, pin description, I/O configuration, interrupt, addressing modes, an overview of 8051 instruction set.

RECOMMENDED BOOKS

- B.B. Brey (PHI), "The Intel. Microprocessors, Architecture, Programming and Interfacing"
- A. Triebel&Avtar Singh (PHI), "The 8088 & 8086 Microprocessor"
- D.V. Hall (Mc-Graw Hill), "Advanced Microprocessor and Interfacing".
- A. Pal (TME), "Microprocessors Principles & Applications:.
- R.L. Krutz (John Wiley), "Interfacing techniques in Digital Design with emphasis on Microprocessors".
- A.P. Mathur (TMA), "Introduction to Microprocessors". Intel Corporation Microprocessors Data manuals.
- Microprocessor Training Inc., "Microprocessor Fundamentals & Applications (Handson)"

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Write programs to run on 8086 microprocessor based systems.
- Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Distinguish between RISC and CISC processors.
- Understand interfacing with different peripheral devices.

Department of CSE&IT
Microprocessor & Interfacing
(BCSL 504)
List of Experiment

1. Write an assembly language program to perform the subtraction of two 8-bit number using 8085/8086 instruction set.
2. Write an assembly language program to move data block starting at location 'X' to location 'Y' without overlap using 8085/8086 instruction set.
3. Write an assembly language program to move data block starting at location 'X' to location 'Y' with overlap using 8085/8086 instruction set.
4. Write an assembly language program to arrange set of 8-bit numbers starting at location in ASCENDING/DESCENDING order. Display the stored vector in address data field using 8085/8086 instruction set.
5. Write an assembly language program to perform the multiplication of two 8-bit numbers using 8085/8086 instruction set.
6. Write an assembly language program to perform the division of two 8-bit numbers using 8085/8086 instruction set.
7. Write an assembly language program to find the larger number in array of data using 8085/8086 instruction set.
8. Write an assembly language program to convert two BCD numbers in memory of the equivalent HEX number using 8085/8086 instruction set.
9. Write an assembly language program to convert given hexadecimal number into its equivalent BCD number using 8085/8086 instruction set.
10. Write an assembly language program to convert given hexadecimal number into its equivalent ASCII number using 8085/8086 instruction set.
11. Write an assembly language program to convert given ASCII character into its equivalent hexadecimal number using 8085/8086 instruction set.

Department of Computer Science & Engineering and Information Technology

THEORY OF COMPUTATION
BCSL 505

L	T	P	C
3	1	2	5

COURSE OBJECTIVE

The objective of this course is providing a basic understanding, mathematical foundation of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.

UNIT-I Introduction of Automata Theory, Examples of automata machines, Finite Automata as a language acceptor and translator, Moore machines and mealy machines, composite machine, Conversion from Mealy to Moore and vice versa.

UNIT-II Types of Finite Automata, Non Deterministic Finite Automata (NDFA), Deterministic finite automata machines, conversion of NDFA to DFA, minimization of automata machines, regular expression, Arden's theorem. Meaning of union, intersection, concatenation and closure, 2 way DFA.

UNIT-III Grammars, types of grammar, context sensitive grammar, context free grammar, regular grammar. Derivation trees, ambiguity in grammar, simplification of context free grammar, conversion of grammar to automata machine and vice versa, Chomsky hierarchy of grammar, killing null and unit productions. Chomsky normal form and greibach normal form.

UNIT-IV Push down automata (PDA), example of PDA, deterministic and non-deterministic PDA, conversion of PDA into context free grammar and vice versa, CFG equivalent to PDA, Petrinet model.

UNIT-V Turing machine, Techniques for construction. Universal Turing machine Multitape, multihead and multidimensional Turing machine, N-P complete problems.

RECOMMENDED BOOKS

1. Inroduction to Automata Theory Language & Computation, Narosa Publication ByHopcroft& Ullman.

2. Element of the Theory Computation : Lewis &Christors. * Theory of Computation – Chandrasekhar & Mishra.

3. Theory of Computation – Wood. * Introduction to Computing Theory : Daniel I-A Cohen.

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Analyze and design Automata machine with and without output.
- Analyze and design Regular expression from DFA vice versa. Pumping lemma to prove whether statement is regular or not. Properties of regular language.
- Analyze and design context free grammar and various simplification rules.
- Analyze and design Push down automata. Conversion method for push down automata to Context free grammar vice versa.
- Analyze and design Turing machine and many improved version of it.
  Understand key notions, such as algorithm, computability, decidability, and complexity through problem solving.

Department of CSE&IT
Theory of Computation
(BCSL 505)
Experiment List

1. Program for creating a machine that accepts string ending with 101

2. Program for creating a machine that accepts string having three consecutive 1's

3. Program for creating MOD-3 machine

4. Program for creating MOD-2 machine

5. Program for creating machine which accepts string having equal no. of 1's and 0's

6. Program for creating a machine which counts number of 1's and 0's in a given string

7. Program for creating a machine that accepts even string (using stack)

8. Program for creating that accepts string having second last element 0's

9. Program for creating a machine that accepts string having two consecutive 0's

10. Design a PDA that accepts $a^n b^m c^n$ using stack

11. Design a PDA that accepts odd string

Department of Computer Science & Engineering and Information Technology

JAVA PROGRAMMING (LAB)

BCSP 506

L	T	P	C
0	0	2	1

COURSE OBJECTIVES

- To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To be aware of the important topics and principles of software development.
- To acquire the ability to write a computer program to solve specified problems.
- To be able to use Java SDK environment to create, debug and run simple Java programs.

Unit I   **Introduction to Java programming:** The Java Virtual Machine, Installing Java, Java Program Development , Java Source File Structure ,Compilation, Executions.Packages, Package access, Variables and data types, Conditional and looping constructs, Arrays.

Unit II   **Object-oriented programming with Java Classes and Objects:** Fields and Methods, Constructors, Overloading methods, Nested classes, Overriding methods, Polymorphism, Making methods and classes final, Wrapper classes.

Unit III   **Extending Classes and Inheritance:** Types of Inheritance in Java, Abstract classes and methods, Interfaces, use of 'super', Polymorphism in inheritance. Garbage collection in JAVA. Exception handling: Try- Catch, Throw, Throws, Finally constructs, The Exception class.

Unit IV   **String Package and Multithreading:** Operation on String, Mutable & Immutable String, Tokenizing a String, Creating Strings using StringBuffer class.Understanding Threads: Needs of Multi-Threaded Programming, Thread Life-Cycle, Thread Priorities and Synchronizing Threads.

Unit V   **The I/O Package:**InputStream and OutputStream classes, Reader and Writer classes, Basics of AWT, Swing and Applets: Layout Managers, Event Handling, Classes for various controls, such as label, choice, list, checkbox, etc., Dialogs and frames using

menus. Basic concepts of networking: Working with URLs, Concepts of URLs and Sockets. Basics of database connectivity with JDBC.

RECOMMENDED BOOKS

1. E. Balagurusamy, "Programming with JAVA: A Primer", Tata McGraw Hill.
2. Herbert Schildt, "JAVA: The Complete Reference", McGraw Hill Education.

COURSE OUTCOMES

Students completing the course will be able to know-

- The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism.
- Fundamental features of an object oriented language like Java: object classes and interfaces, exceptions and libraries of object collections.
- Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
- Design, implement, test, debug, and document GUI, event-driven programs.
- How to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.
- How to test, document and prepare a professional looking package for each business project using javadoc.

Department of Computer Science & Engineering and Information Technology
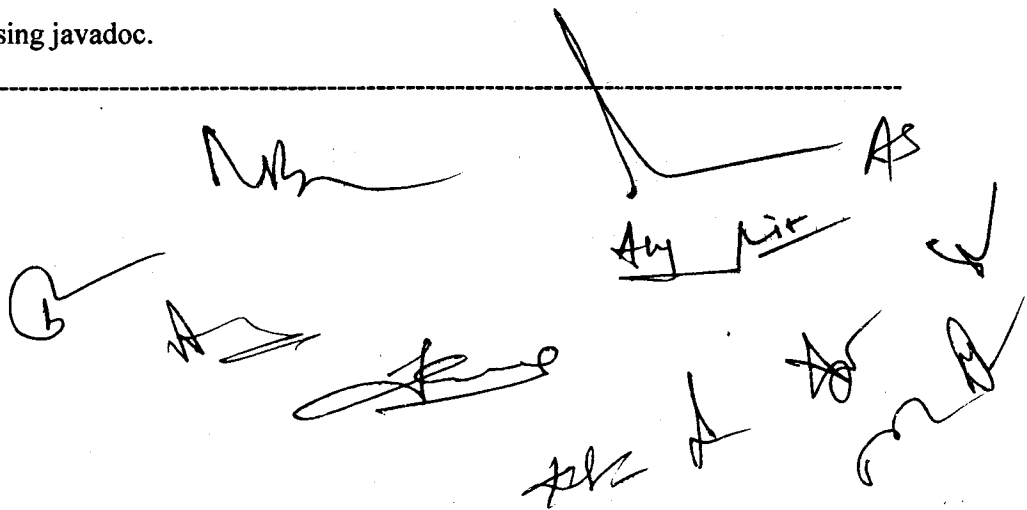
INTERNET TECHNOLOGY & WEB DESIGNING

BCSL509

Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To describe Internet hardware components and their interaction, including server and client computers, hubs, switches and routers.
- To compare different guided and unguided media used to transmit Internet communications.
- To describe different data formats and file types available on the Internet.
- To describe Internet software components and their interaction, including clients and server software for web and e-mail.
- To compare features of different Internet navigation tools.
- To compare features of different Internet communication tools.
- To describe Internet providers and compare ways individuals and organizations obtain connections to the Internet.
- To develop an ability to design and implement static and dynamic website.

UNIT-I   Basics of Internet, Elements of Internet, Routers, Antennas, Gateways, Internet, Internet Links, Media Communication for Internet, VSAT, Global E-Mail, Browsing and Search Technologies, Search Engines, Web Browser, URL, Types of Browsers, Web Servers, Microsoft, Netscape and other Web Browser & Servers, Internet Protocols, Internet and The World Wide Web.

UNIT-II   User Experience Design:Basics UX TerminologyUXD in SDLC. Rapid prototyping in requirements, Client Tier using HTML5, basic HTML tags, Look and feel using CSS, client side scripting using java script (JS)and validations, Document object model(DOM), JQuery, ASP.

UNIT-III   Business tier using POJO(Plain Old Java Object): Introduction to Frameworks, Introduction to POJO, Multithreaded Programming, Java I/O,JDBC.

UNIT-IV   Presentation tier using JSP: Role of Java EE in Enterprise Applications, Basic of Servlets, To introduce server side programming with JSP, Standard tag library

UNIT-V   Web Management: Fault Management, Configuration and Performance Management, System Management, Application and Service Management, Web-Based Enterprise   Management

RECOMMENDED BOOKS

- Web-based Management, Harmedy (Prentice Hall).
- Web-Design, John McCoy (BPB Publications).

COURSE OUTCOMES

After completion of this course, the students would be able to:

An ability to understand the basic concepts of Internet programming and protocols used.

- Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
- Implement a Good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services.
- Get introduced in the area of Online Game programming.
- Ability to Internet-related careers and professions and the roles taken by members of a large web development team.
- Ability to access of files, including directories and URLs.

Department of Computer Science & Engineering and Information Technology

MANAGEMENT INFORMATION SYSTEMS

BCSL 510

Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To Evaluate the role of the major types of information systems in a business environment and their relationship to each other
- To introduce the impact of the Internet and Internet technology on business electronic commerce and electronic business
- To Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.

UNIT-I INTRODUCTION

Data, Information, Intelligence, Information Technology, Information System, evolution, types based on functions and hierarchy, System Analyst – Role, Functions.

UNIT-II SYSTEMS ANALYSIS AND DESIGN

SDLC, SSLC, Systems Analysis and System Design, Tools – DFD – ER – Object modeling,DBMS – RDBMS – OODBMS.

UNIT-III INFORMATION SYSTEM

Financial, Marketing, Personnel, Production, Materials Information System, DSS, EIS, KMS, GIS, International Information System.

UNIT-IV SECURITY AND CONTROL

Security, Testing, Error detection, Controls, IS Vulnerability, Computer Crimes, Securing the Web, Intranets and Wireless Networks, Software Audit, Ethics in IT.

UNIT-V NEW IT INITIATIVES

e- business, e-governance, ERP, SCM, e-CRM, Datawarehousing and Data Mining, Business Intelligence, Pervasive Computing, CMM.

RECOMMENDED BOOKS

1. Robert Schultheis and Mary Summer, Management Information Systems – The Managers View, Tata McGraw Hill, 2008.
2. Kenneth C. Laudon and Jane Price Laudon, Management Information Systems

---

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Understand the basic concepts and technologies used in the field of management information systems.
- Understand the processes of developing and implementing information systems.
- Develop an understanding of how various information systems work together to accomplish the information objectives of an organization.
  Use the application software skills such as analyzing spreadsheets, creating database, and Web browsing, that they have learned in other courses to apply to real-world business problems.

Department of Computer Science & Engineering and Information Technology

PARALLEL PROCESSING
BCSL601
Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To describe different parallel processing architectures based on relationships between processing elements, instruction sequence, memory and interconnected network.

- To identify algorithms, which require parallelization as part of system design or performance enhancement.

- To Classify shared and distributed memory parallel systems according to their properties and usage models.

- To Design and develop parallel algorithms for shared and distributed memory models.

- To evaluate the performance of parallel algorithms designed based on shared and distributed memory models as well as against serial based algorithm designs.

UNIT-I   **Introduction to Parallel Processing :**Multiprogramming and Time Sharing, Parallelism in Uniprocessor system, Parallel computer structure, Architectural classification schemes, Parallel processing applications.

UNIT-II   **Principles of Pipelining :**Pipelining principle of linear pipelining, Performance measures, General Pipelines, reservation tables, Instruction and Arithmetic pipelines, Instruction Prefect, Branch handling, Data Buffering, Internal Forwarding and Register tagging, Hazard detection and resolution, Job Sequencing and Collision prevention.

UNIT-III   **Vector Processing :** Vector processing requirements, Characteristics of vector processing multiple vector task dispatching, pipeline vector processing methods, vector super

computers, recent vector processors, Architecture of CRAY, Pipeline chaining and vector loops, Architecture of CYBER, Reconfigurability.

UNIT-IV   Array Processing : SIMD organization, Interconnection networks, Parallel algorithm for array processor-Matrix Multiplication Parallel sorting on Array Processor, SIMD Fast Fourier transform, Connection issues for SIMD Processing.

UNIT-V   Multiprocessor Architecture, Programming &Control :Loosely and Tightly Coupled Architectures. Functional Structures, Types Interconnection networks, Parallel memory organizations Process Synchronization mechanism : Semaphores, Critical Section and monitors, System deadlocks and protection schemes, Multiprocessor scheduling strategies, Parallel algorithms.

RECOMMENDED BOOKS

- Computer Architecture and Parallel Processing By K. Hwang and Briggs (TMH)
- Advanced Computer Architecture By K. Hwang (TMH) * Computer Architecture and Organization :J.P. Hayes TMH

COURSE OUTCOMES

Students who complete this course successfully are expected to:

- Recall fundamental concepts of parallelism.
- Understand Develop message-passing parallel programs with MPI
- Understand and Apply shared memory parallel program concepts with Java threads .
- Illustrate multi-threaded and message passing parallel algorithms.
- Design and analyze the parallel algorithms for real world problems and implement them on available parallel computer systems.
- Reconstruction of emerging parallel algorithms with MPI.
- Compare and contrast various parallel algorithms using shared memory and MPI.
- Compute contemporary parallel algorithms.

Department of Computer Science & Engineering and Information Technology

MOBILE COMPUTING

BCSL602

L	T	P	C
3	1	-	4

COURSE OBJECTIVE

To introduce the basic concepts and principles in mobile computing. This includes the major techniques involved, and networks & systems issues for the design and implementation of mobile computing systems and applications.

UNIT- I Review of Personal Communication Services (PCS), Basic concepts of cellular systems, Global system for Mobile Communication (GSM), Protocols, Handover, Data Services, Multiple Division Techniques.

UNIT- II General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

UNIT-III Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, Wireless Markup Languages (WML)

UNIT-IV Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

UNIT-V Wireless local Loop (WLL): Introduction to WLL architecture, WLL technologies. Global Mobile Satellite Systems: Case studies of IRIDIUM and GLOBALSTAR systems. Bluetooth technology, Wi-Fi and Wi-Max.

RECOMMENDED BOOKS

- "Mobile communications," J. Schiller, Pearson Education Pvt. Ltd., 2002.
- "Wireless and Mobile Networks Architecture," by Yi –Bing Lin &ImrichChlamatac, John Wiley & Sons, 2001.
- "Mobile & Personnel Communication Systems and Services", By Raj Pandya, Prentice Hall India, 2001.
- "Wireless Communication- Principles and practices," 2nd Ed., Theodore S. Rappaport, Pearson Education Pvt. Ltd, 2003.
- "The Wireless Application Protocol," Singhal& Bridgman et. al.,Pearson Education, 2004.

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Describe the basic concepts and principles in mobile computing
- Able to understand the infrastructure to develop mobile communication systems and the characteristics of different multiple access techniques in mobile communication
- Analyze the measures to increase the capacity in GSM systems and the entire protocol architecture of GSM- communication protocols for radio resource management, mobility management, connection management at the air interface mechanisms for authentication and encryption
- Describe and analyze the different inter-networking challenges and solutions in wireless mobile networks-Network and Transport Layers
- The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile communication contexts
- Understand the concept of Wireless LANs and Mobile Networks
- Explain the structure and components for Mobile IP and Mobility Management
- Identify and apply relevant problem solving methodologies
- An awareness of professional and ethical issues, in particular those relating to security and privacy of user data and user behavior

Department of Computer Science & Engineering and Information Technology

SOFTWARE PROJECT MANAGEMENT

BCSL 603

L	T	P	C
3	1	2	5

COURSE OBJECTIVES

- To understand Software Project Models and Software Management Concepts.
- To understand the various methods of Cost Estimation.
- To Study about Software Quality Management.
- To Study about Software Metrics.
- To understand Project Evaluation.

UNIT – I   Project Concepts and Its Management

Project life cycle models - ISO 9001 model - Capability Maturity Model - Project Planning - Project Tracking - Project Closure. Evolution of Software Economics - Software Management Process Framework; Phases, Artifacts, Workflows, Checkpoints = Software Management Disciplines; Planning / Project Organization and Responsibilities / Automation / Project Control - Modern Project Profiles.

UNIT –II   Cost Estimation

Problems in Software Estimation - Algorithmic Cost Estimation Process, Function Points, SLIM (Software Life Cycle Management), COCOMO II (Constructive Cost Model) - Estimating Web Application Development - Concepts of Finance, Activity Based Costing and Economic Value Added (EVA) - Balanced Score Card.

UNIT –III Software Quality Management

Software Quality Factors - Software Quality Components - Software Quality Plan - Software Quality Metrics - Software Quality Costs - Software Quality Assurance Standard - Certification - Assessment.

UNIT-IV   Software Management and Metrics

Software Configuration Management - Risk Management: Risk Assessment: Identification / Analysis / Prioritization - Risk Control: Planning / Resolution / Monitoring - Failure Mode and Effects Analysis (FMEA) - Defect Management - Cost Management. Software Metrics - Classification of Software Metrics: Product Metrics: Size Metrics, Complexity Metrics, Halstead's Product Metrics, Quality Metrics, and Process Metrics.

UNIT-V Project Evaluation and Emerging Trends

Strategic Assessment - Technical Assessment - Cost Benefit Analysis - Cash Flow Forecasting - Cost Benefit Evaluation Technique - Risk Evaluation - Software Effort Estimation. Emerging Trends: Import of the internet on Project Management - people Focused Process Models.

RECOMMENDED BOOKS

- "Software Project Management", by Bob hughes and mike cotterell, second edition, 1999.

- "Managing and global software projects" by Ramesh Gopalaswamy, Tata McGraw Hill Tenth Reprint, 2011.

- "Software Engineering - A Practitioner's Approach", by Roger S. Pressman, 7th Edition, McGraw Hill, 2010.

- "Software Quality Assurance: from Theory to Implementation", by Daniel Galin, Addison-Wesley, 2003.

- "Software Project Management in Practice", by PankajJalote, Pearson, 2002.

- "Metrics and Models in Software Quality Engineering", by Stephen H, Kan, Addison-Wesley, 2002.


COURSE OUTCOMES

After completion of this course, the students would be able to:

- The student will understand the unique consideration of the software development life cycle that impact project management.
- More specifically, the student will learn about best practices in the field. As a result of this study.

- The student will be able to leverage templates and skills to become one of the top project managers in the latest methodologies available in software project management with core knowledge.
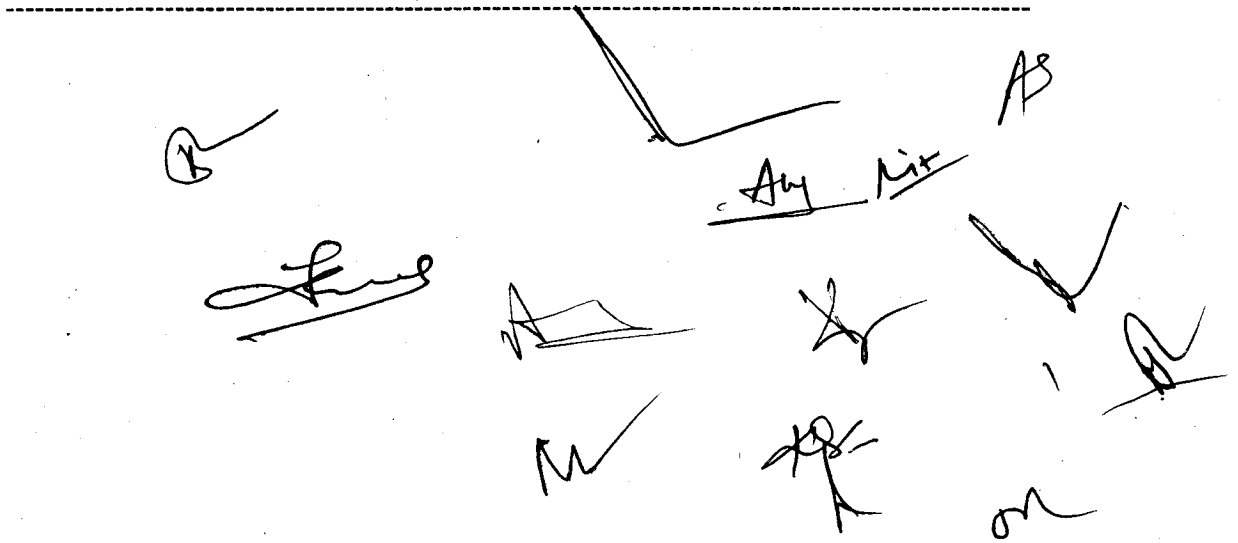
Department of CSE&IT
Software Project Management
(BCSL-603)
List of Experiments

Exercise No 1:

Study of Various Software Models in Software Project Management

Exercise No 2:

Study of Star UML tool for UML diagram designing
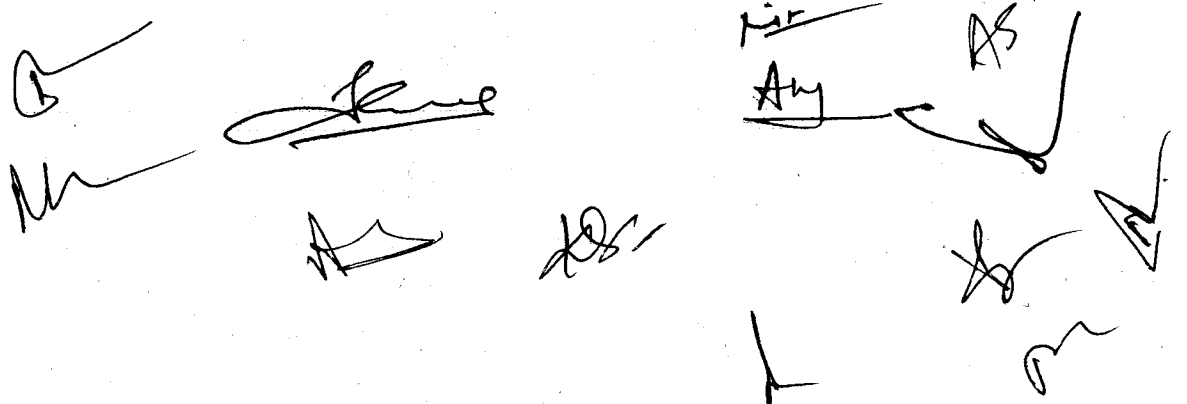
Exercise No 3:

Design the Data Flow diagrams (DFD) for Student database, Railway Reservation system

Exercise No 4

Design of UML Diagrams for Restaurant System, ATM machine

Exercise No 5

Study of various software management techniques like PERT, CPM.

Department of Computer Science & Engineering and Information Technology

COMPILER DESIGN

BCSL604

L	T	P	C
3	1	2	5

COURSE OBJECTIVES

- To introduce the major concept areas of language translation and compiler design
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation and use of symbol table
- To extend the knowledge of parser by parsing LL parser and LR parser.
- To provide practical programming skills necessary for constructing a compiler

----

UNIT-I   **Overview of Translation Process:** Introduction to Compiler, Major Data Structures in Compiler, Other Issues in Compiler Structure, BOOT Strapping and Porting, Compiler Structure: Analysis-Synthesis Model of Compilation, Various Phases of a Compiler, Tool Based Approach to Compiler Construction.

UNIT-II   **Lexical Analysis:** Input Buffering, Symbol Table, Token, Recognition of Tokens, Lexeme and Patterns, Difficulties in Lexical Analysis, Error Reporting and Implementation. Regular Grammar & Language Definition, Transition Diagrams, Design of a Typical Scanner using LEX.

UNIT-III   **Syntax Analysis:** Context Free Grammars (CFGs), Ambiguity, Basic Parsing Techniques: Top Down Parsing, Recursive Descent Parsing, Transformation on the Grammars, Predictive Parsing LL(1) Grammar, Bottom-UP Parsing, Operator Precedence Parsing, LR Parsers (SLR, CLR, LALR), Design of a Typical Parser Using YACC.

UNIT-IV	**Semantic Analysis :** Compilation of expression, control, structures, conditional statements, various intermediate code forms, syntax directed translation, Memory allocation and symbol table organizations, static and dynamic array allocation, string allocation, structure allocation etc., error detection indication and recovery, Routines or printing various lexical, syntax and semantic errors.
UNIT-V	**Code generation and Code Optimization:** Issues, Basic Blocks and Flow Graphs, Register Allocation, Code Generation, DAG Representation of Programs, Code Generation from DAGS, Peep hole Optimization, Code Generator Generators, Specification of Machine. Code Optimization: Source of Optimizations, Optimization of Basic Blocks, Loops, Global Data Flow Analysis, Solution to Iterative Data Flow Equations, Code Improving Transformations, Dealing with Aliases, Data Flow Analysis of Structured Flow Graphs.

RECOMMENDED BOOKS

- A. V. Aho, R. Sethi and J. D. Ullman. Compilers: Principles, Techniques and Tools, Pearson Education.
- K. C. Louden. Compiler Construction: Principles and Practice, Cengage Learning

----
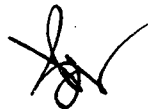
COURSE OUTCOMES

After completion of this course, the students would be able to:

- To apply the knowledge of lex tool &yacc tool to devleop a scanner & parser
- To design & conduct experiments for Intermediate Code Generation in compiler
- To deal with different translators
- To develop program to solve complex problems in compiler
- To learn the new code optimization techniques to improve the performance of a program in terms of speed & space
- To acquire the knowledge of modern compiler & its features
- To learn & use the new tools and technologies used for designing a compiler

Department of Computer Science & Engineering and Information Technology
COMPILER DESIGN
BCSL 604
List of Experiments

1) Write a program to convert NFA to DFA.

2) Write a program to minimize DFA.

3) Develop a lexical analyzer to recognize a few patterns.

4) Write a program to parse using Brute force technique of Top down parsing.

5) Develop LL (1) parser (Construct parse table also).

6) Develop an operator precedence parser (Construct parse table also).

7) Develop a recursive descent parser.

8) Write a program for generating for various intermediate code forms.

i)   Three address code

ii)   Polish notation

9) Write a program to simulate Heap storage allocation strategy.

10) Generate Lexical analyzer using LEX.

11) Generate YACC specification for a few syntactic categories.

12) Given any intermediate code form implement code optimization techniques.

13) Study of an Object Oriented Compiler.

Department of Computer Science & Engineering and Information Technology

NETWORK & WEB SECURITY
BCSL 605

L	T	P	C
3	1	2	5

COURSE OBJECTIVES

- To provide an introduction to the fundamental principles of cryptography and its applications on the network security domain.
- To study various approaches to Encryption techniques, strengths of Traffic Confidentiality, Message Authentication Codes.
- To be familiar with cryptographic techniques for secure (confidential) communication of two parties over an insecure (public) channel; verification of the authenticity of the source of a message.
- To illustrate how network security and management mechanisms employ cryptography to prevent, detect, and mitigate security threats against the network
- To be familiar with malicious software's like Virus & Worms, their working process and characteristics.
- To study various web based attacks like Cross-site Scripting, SQL Injection, DOS attack, session hijacking etc
- To provide an introduction of network forensics and its application in tracking cyber criminals.

UNIT-I Introduction to Network Security, Computer Security and Cyber Security.Security Terminologies and Principle, Security Threats, Types of attacks (Operating System, application level, Shrink Rapport, Misconfiguration attacks etc.).Introduction to Intrusion, Terminologies,Intrusion Detection System (IDS), Types of Intrusion Detection Systems, System Integrity Verifiers (SIVS).Indication of Intrusion: System Indications File System Indications Network Indications. Intrusion Detection Tools ,Post attack IDS Measures

&Evading IDS Systems. Penetration Test ing, Categories of security assessments, VulnerabilityAssessment, Types ofPenetration Testing. Risk Management.

UNIT- II Cryptography, Classical Cryptographic Techniques, Encryption, Decryption, Code Breaking: Methodologies, Cryptanalysis, Cryptography Attacks, Brute-Force Attack, Use of Cryptography. Public key cryptography, Principles of Public key Cryptosystems, Cryptographic Algorithms RSA, Data Encryption Standard (DES), RC4, RC5, RC6, Blowfish, Key Management, Diffie-Hellman key exchange, elliptic curve cryptography.

UNIT-III Hash Functions, One-way Hash Functions, SHA (Secure Hash Algorithm), Authentication Requirements, Authentication Functions, Kerberos. Message Authentication codes ,Message Digest Functions, MD5, SSL (Secure Sockets Layer), SSH (Secure Shell), Algorithms and Security, Disk Encryption, Government Access to Keys (GAK)Digital Signature: Analysis, Components, Method, Applications, Standard, Algorithm: Signature Generation/Verification, ECDSA, Elgamal Signature Scheme, Digital Cert ificates.

UNIT–IV **Trojans and Backdoors**: Overt and Covert Channels, Working, Types (Remote Access Trojans, Data-Sending Trojans, Destructive Trojans, Trojans, Proxy Trojans, FTP Trojans, Security Software Disablers).

Viruses and Worms: Characteristics, Working, Infection Phase, Attack Phase. Sniffers: Definition,spoofing, Sniffing, Vulnerable Protocols, Types.

Phishing: Methods, Process, Attacks Types (Man-in-the-Middle Attacks, URL Obfuscation Attacks, Hidden Attacks, Client-side Vulnerabilities, Deceptive Phishing, Malware-Based Phishing, DNSBased Phishing, Content-Injection Phishing, Search Engine Phishing).

Web Application Security- Secured authentication mechanism, secured session management,

Cross-site Scripting, SQL Injection and other vulnerabilities.

Denial-of Service Attacks: Types of Attacks (Smurf Attack, Buffer Overflow Attack, Ping of Death Attack, Teardrop Attack, SYN Attack, SYN Flooding), DDoS Attack(Distributed DoS Attack.), Session Hijacking, Spoofing v Hijacking, TCP/IP hijacking, CAPTCHA Protection

UNIT- V IP Security, Web Security, Firewalls: Types, Operation, Design Principles, Trusted Systems. Computer Forensics, Need, Objectives, Stages & Steps of Forensic Investigation in Tracking Cyber Criminals, Incident Handling.Hacking, Classes of Hacker (Black hats, grey hats, whitehats, suicide hackers), Foot printing, Scanning (Types-Port, Network, Vulnerability), E-Mail Spiders, Overview of System Hacking Cycle

RECOMMENDED BOOKS

- William Stallings, "Cryptography and Network Security: Principles and Practice" Pearson
- Charlie Kaufman, Radia Perlman, Mike Speciner, MichaelSpeciner, " Network Security Private communication in a public world" TMH
- Behrouz A. Forouzan, "Cryptography & Network Security" TMH
- Joseph MiggaKizza, Computer Network Security, Springer International Edition
- AtulKahate,"Cryptography and Network Security" McGraw Hill
- Carl Endorf, Eugene Schultz, Jim Mellander "INTRUSION DETECTION & PREVENSION" TMH

COURSE OUTCOMES

After completion of this course, the students would be able to:

- To have a fundamental understanding of the objectives of cryptography and network security.
- To become familiar with the cryptographic techniques that provides information and network security.
- To impart knowledge on Encryption techniques, Design Principles and Modes of operation.
- To analyze a given system with respect to security of the system.
- To understand the Key Management techniques and Number Theory.
- To create an understanding of Authentication functions the manner in which Message Authentication Codes and Hash Functions works.
- To examine the issues and structure of Authentication Service and Electronic Mail Security
- To create an understanding of malicious software and existing web based attacks.
- To provide familiarity in Intrusion detection and Firewall Design Principles.
- To create an understanding of network forensic procedure to caught cyber criminals.

Department of CSE & IT
Network & Web Security
BCSL 605
List of Experiments

1. Footprinting using footprinting tools(Open Source & Free)(ex-nslookup, ARIN, Whois, Google Earth etc..)

2. Scanning for vulnerabilities using (Angry IP, HPing2, IPScanner, Global Network Inventory Scanner, Net Tools Suite Pack.)

3. NetBIOS Enumeration Using NetView Tool, Nbtstat Enumeration Tool (Open Source).

4. Steganography using tools: Tool: Merge Streams, Image Hide, Stealth Files, Blindside, STools, Steghide, Steganos, Pretty Good Envelop, Stegdetect,.

5. Steganalysis - Stego Watch- Stego Detection Tool, StegSpy.

6. How to Detect Trojans by using – Netstat, fPort, TCPView, CurrPorts Tool, Process Viewer.

7. Lan Scanner using look@LAN, wireshark.

8. Understanding DoS Attack Tools- Jolt2 , Bubonic.c, Land and LaTierra, Targa, Nemesy Blast, Panther2, Crazy Pinger, Some Trouble, UDP Flood, FSMax.

Department of Computer Science & Engineering and Information Technology

INFORMATION THEORY AND CODING
BCSL609
Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVE

The objective of this course is providing a basic understanding of the nature of information and the construction of both source codes and error-detection/-correction codes. Topics will include Source Coding, Channel Coding, Image and Audio & Video Compression and Cryptography.

UNIT-I   Uncertainty, Information and entropy information measures: characteristics of information measure. Shannon's concept of information, Shannon's measure of information model for source coding theorem communication system: source coding ad line. Channel coding, channel mutual information capacity (BW)

UNIT-II Channel coding, theorem for discrete memory less channel, information capacity theorem: error detecting and error correcting codes, types of codes: block codes, hamming and Lee metrics, description of linear block codes by matrices, description of linear tree codes by matrices, parity check codes and parity check polynomials.

UNIT-III Compression : loss less and lossy, Huffman codes, Binary image compression schemes, run length encoding, CCITT group 3 1-D compression, CCITT group 3 2D compression, CCITT group 4 2D Compression.

UNIT-IV Video image compression: Requirement of full motion video compression. CITT H 261 Video coding algorithm, MPEG compression methodology.MPEG-2 compression, audio (speech) compression.

UNIT-V Cryptography: encryption, decryption, cryptogram (hypertext). Concept of cipher, crypto analysis.Keys: single key (secret key) cryptography, two key (Public-key) cryptography. Single key cryptography chipers : block cipher codes, stream ciphers, requirements for secrecy, the data encryption standard, public key cryptography : diffle-helhman public key distribution, the revest-shamiradelman (R-S-A) system for public key cryptography. Digital signature.

RECOMMENDED BOOKS

- Error correcting codes by WW person and E J Welton, the mit press
- Multimedia system design – P K Andleigh and KiranThapar, Prentice Hall PTR upper saddle river
- Communication Systems, by Simon Haykin John Wiley and sons
- Network Security – Stalling.

COURSE OUTCOMES

After the successful completion of this course, the student would be able to:

- Understand the knowledge of probabilities, entropy, measures of information.
- Understand the channel capacities and properties using Shannon's Theorems.
- Analyze information content of a random variable from its probability distribution.
- Analyze linear block code, cyclic code and convolution code for error detection and correction.
- Understand various compression techniques for image, audio and video.
- Understand basic concept of cryptography.

Department of Computer Science & Engineering and Information Technology

Cloud Computing
BCSL 610
Elective-I

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To introduce the broad perceptive of cloud architecture and model.
- To understand the concept of Virtualization.
- To apply different cloud programming model as per need.
- To be able to set up a private cloud.

UNIT-I CLOUD ARCHITECTURE AND MODEL

Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT-II VIRTUALIZATION

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

UNIT III CLOUD INFRASTRUCTURE

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNIT-IV PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms– MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support -

Google App Engine,

Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

UNIT-V SECURITY IN THE CLOUD

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.
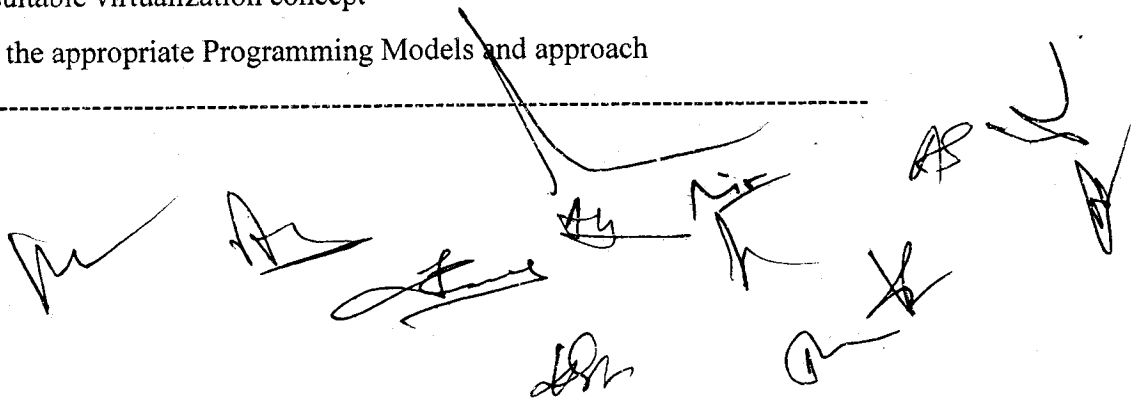
RECOMMENDED BOOKS

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.

2. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.

3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.

4. Kumar Saurabh, " Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011

5. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly

6. James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Compare the strengths and limitations of cloud computing.
- Identify the architecture, infrastructure and delivery models of cloud computing.
- Apply suitable virtualization concept
- Choose the appropriate Programming Models and approach

Department of Computer Science & Engineering and Information Technology

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
CSL 701

L	T	P	C
3	1	2	6

COURSE OBJECTIVES

- To provide an introduction to the Artificial Intelligence and its methods.
- To give a good exposure related to Artificial Intelligent heuristic search Algorithms.
- To enhance the capability of analysis for Machine learning and fuzzy logic.
- To apply the mathematical concepts in designing and executing the knowledge representation and problem solving.
- To design the mathematical model and rule formation for production system.

UNIT-I **Definition:** Scope, Task and Objectives of Artificial Intelligence, AI Problems, Applications of AI. The Importance of AI, AI and related fields. Problems, Problem Spaces and Production System. Components of Production System, Characteristics of Production Systems, Types of Production System. Control Strategies, Application of Production Systems, water-jug, 8 – Puzzle and other advance Problems.

UNIT-II **Searching :** The Blind and Informed Searches, Breadth First Search, Depth First Search and their implementation using Open and Closed list, Heuristic estimation and evaluation, Hill climbing and their Problems, Best First Search, Searching And-Or Graphs, A * search, AO * search.

UNIT-III **Knowledge Representation:** General Concept, Introduction, Definition and importance Of Knowledge, Approaches to knowledge Representation, Issues in

Knowledge Representation, Procedural and Declarative Knowledge, Forward Versus Backward Reasoning, Knowledge Representation Techniques: Logics, Prepositional Logic, Predicate Logic.

UNIT-IV   Semantic Nets, Frames, Conceptual Dependencies, Scripts, Bay's Theorem, Fuzzy Logic, Game Playing: Min – Max Search Procedure.

UNIT-V·   Planning, Understanding, Natural Language Processing, Speech Recognition, Computer Vision, Expert System and Expert System Cell.

RECOMMENDED BOOKS
- Artificial Intelligence–Rich & Knight
- Artificial Intelligence and Expert System–Dan. W. Patterson
- Artificial Intelligence: Structures and Strategies for Complex Problem Solving-George F. Lunger & William A. Stubblefield, Addison-Wesley Longman Publishing Co.
- Artificial Intelligence - Nil. J. Nillson

COURSE OUTCOMES
After completion of this course, the students would be able to:

- Understand the basic concept of intelligent methods.
- Understand various algorithms for efficient informed search.
- Analyse knowledge representation methods.
- Analyse machine learning methods and robotics.
- Develop game playing techniques.
- Apply mathematical formulations, algorithmic principles, programming methods in puzzle solving techniques.

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

CSL 701

1) Write a Program to implement the DFS algorithm.

2) Write a Program to implement the BFS algorithm.

3) Write a Program to implement the Water Jug problem.

4) Write a Program to implement the 8 Puzzle problem.

5) Write a Program to implement A* algorithm.

6) Write a Program to implement the Heuristic approach.

7) Write a Program to implement Game playing using Min Max approach.

Department of Computer Science & Engineering and Information Technology

COMPILER DESIGN & TRANSLATOR
CSL 702

L	T	P	C
3	1	2	6

COURSE OBJECTIVES

- To introduce the major concept areas of language translation and compiler design
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation and use of symbol table
- To extend the knowledge of parser by parsing LL parser and LR parser.
- To provide practical programming skills necessary for constructing a compiler.

UNIT-I   **Overview of Translation Process:** Grammars, Tokens and Alphabets, Strings, Classes of grammars. Sentential forms, Derivation and reduction trees, Ambiguity.

UNIT-II   **Finite Automata And Lexical Analysis:** Transformation of NDFSM to DFSM, Regular expressions, from regular expression to finite automata, Minimizing of DFA, Implementation of lexical Analyzer – Delimiter and reserve words, Literals, Strings, Identifiers, Keywords, special, tokens.

UNIT-III   **Syntax Analysis:** Context Free Grammars (CFGs), Ambiguity, Basic Parsing Techniques: Top Down Parsing, Recursive Descent Parsing, Transformation on the Grammars, Predictive Parsing LL(1) Grammar, Bottom-UP Parsing, Operator Precedence Parsing, LR Parsers (SLR, CLR, LALR), Design of a Typical Parser Using YACC.

UNIT-IV   **Semantic Analysis:** Compilation of expression, control, structures, conditional statements, various intermediate code forms, syntax directed translation, Memory allocation and symbol table organizations, static and dynamic array allocation, string allocation, structure allocation etc., error detection indication and recovery, Routines or printing various lexical, syntax and semantic errors.

UNIT-V   **Code Optimization:** Optimization issues, X-formations, local and global, Optimization, program flow analysis etc., Incremental compilers and interpreters, structure of target program, error handling, conversational debugging, structure of an incremental compiler.

RECOMMENDED BOOKS

- A. V. Aho, R. Sethi and J. D. Ullman. Compilers: Principles, Techniques and Tools, Pearson Education.
- K. C. Louden. Compiler Construction: Principles and Practice, Cengage Learning

----

COURSE OUTCOMES

After completion of this course, the students would be able to:

- To apply the knowledge of lex tool &yacc tool to devleop a scanner & parser
- To design & conduct experiments for Intermediate Code Generation in compiler
- To deal with different translators
- To develop program to solve complex problems in compiler
- To learn the new code optimization techniques to improve the performance of a program in terms of speed & space
- To acquire the knowledge of modern compiler & its features
- To learn & use the new tools and technologies used for designing a compiler

----

Compiler Design & Translator
(CSL-702)

1) Write a program to convert NFA to DFA.

2) Write a program to minimize DFA.

3) Develop a lexical analyzer to recognize a few patterns.

4) Write a program to parse using Brute force technique of Top down parsing.

5) Develop LL (1) parser (Construct parse table also).

6) Develop an operator precedence parser (Construct parse table also).

7) Develop a recursive descent parser.

8) Write a program for generating for various intermediate code forms.

i) Three address code

ii) Polish notation

9) Write a program to simulate Heap storage allocation strategy.

10) Generate Lexical analyzer using LEX.

11) Generate YACC specification for a few syntactic categories.

12) Given any intermediate code form implement code optimization techniques.

13) Study of an Object Oriented Compiler.

Department of Computer Science & Engineering and Information Technology

PARALLEL PROCESSING
CSL 703

L	T	P	C
3	2	1	6

COURSE OBJECTIVES

- To describe different parallel processing architectures based on relationships between processing elements, instruction sequence, memory and interconnected network.
- To identify algorithms, which require parallelization as part of system design or performance enhancement.
- To Classify shared and distributed memory parallel systems according to their properties and usage models.
- To Design and develop parallel algorithms for shared and distributed memory models
- To evaluate the performance of parallel algorithms designed based on shared and distributed memory models as well as against serial based algorithm designs.

UNIT-I   **Introduction to Parallel Processing:** Multiprogramming and Time Sharing, Parallelism in Uniprocessor system, Parallel computer structure, Architectural classification schemes and Parallel processing applications.

UNIT-II   **Principles of Pipelining:** Pipelining principle of linear pipelining, Performance measures, General Pipelines, reservation tables, Instruction and Arithmetic pipelines, Instruction Prefect, Branch handling, Data Buffering, Internal Forwarding and Register tagging, Hazard detection and resolution, Job Sequencing and Collision prevention.

UNIT-III   **Vector Processing:**Vector processing requirements, Characteristics of vector processing multiple vector task dispatching, pipeline vector processing methods, vector super computers, recent vector processors, Architecture of

CRAY, Pipeline chaining and vector loops, Architecture of CYBER, Configurability.

UNIT-IV **Array Processing:** SIMD organization, Interconnection networks, Parallel algorithm for array processor-Matrix Multiplication Parallel sorting on Array Processor, SIMD Fast Fourier transform, Connection issues for SIMD Processing.

UNIT-V **Multiprocessor Architecture, Programming & Control:** Loosely and Tightly Coupled Architectures. Functional Structures, Types Interconnection networks, Parallel memory organizations Process Synchronization mechanism : Semaphores, Critical Section and monitors, System deadlocks and protection schemes, Multiprocessor scheduling strategies, Parallel algorithms.

RECOMMENDED BOOKS

- Computer Architecture and Parallel Processing By K. Hwang and Briggs (TMH)
- Advanced Computer Architecture By K. Hwang (TMH) * Computer Architecture and Organization :J.P. Hayes TMH

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Recall fundamental concepts of parallelism.
- Understand Develop message-passing parallel programs with MPI
- Understand and Apply shared memory parallel program concepts with Java threads
- Design and analyze the parallel algorithms for real world problems and implement them on available parallel computer systems.
- Compare and contrast various parallel algorithms using shared memory and MPI.
- Compute contemporary parallel algorithms.

Department of Computer Science & Engineering and Information Technology

NETWORKING WITH TCP/IP
CSL 704

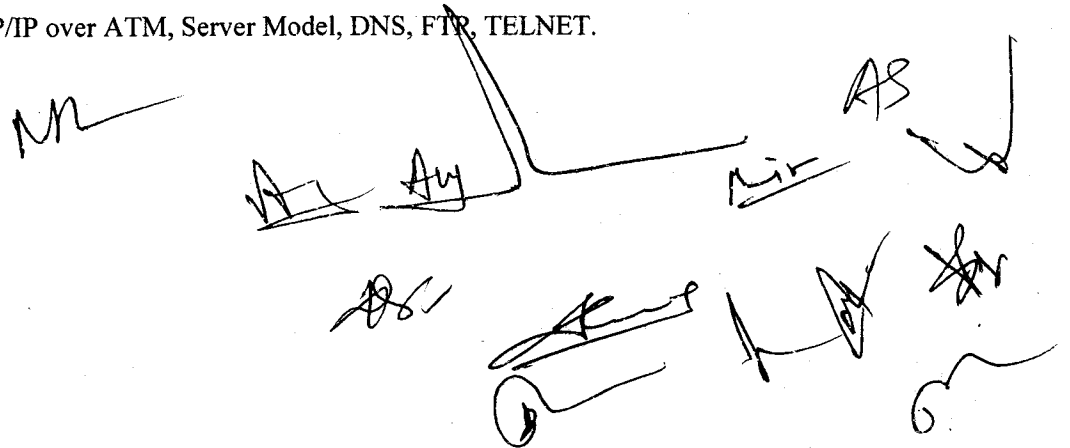| L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To build an understanding of the fundamental concepts of TCP/IP with computer networking.
- To familiarize the student with the basic taxonomy and terminology of the TCP/IP area.
- To analyze of Concepts of fundamental protocols
- To understand the network traffic, congestion, controlling and resource allocation.

UNIT-I Introduction, Review of Network Protocols & Architecture. ISDN – ISDN, BISDN & ATM. ATM Switching. CELL relay and Frame relay, SONET & SDH LAN – Access and throughput analysis of LAN's Fast LAN's and Wireless LAN's Interconnecting LAN's ARPANET.

UNIT-II Internet Working – Repeaters, Routers, Gateways, Connection Oriented & Connection Less Internet Working, Internet Addresses. IP, IPV4, IPV6, Routing of IP datagram. ICMP, CIDR. Mapping Address to Physical Address. Internet (ARP) and RARP.

UNIT-III TCP and UDP :- TCP :- Reliable data transfer, Connection Establishment & Release. TCP Frame, Header Checksum, Sliding Window Concept for error control. UDP :- Format, Pseudo header, Encapsulation, Checksum, Multiplexing & Demultiplexing.

UNIT-IV TCP/IP over ATM, Server Model, DNS, FTP, TELNET.

UNIT-V   Internet Applications & Security – Remote Login, SMTP, Internet security & Firewalls. Future of TCP/IP. IPV4 & IPV6 Security, HTTP.

RECOMMENDED BOOKS

- Data and Computer Communication - W. Stalling, Pearson.
- Internetworking with TCP/IP - Vol. - I - D.E. Comer, PHI.
- Data Communication & Networking -B.A. Forouzan.
- ISDN and Broad band ISDN with Frame Relay& ATM - W. Stalling.
- Local Area Networks- Gerd Keiser (TMH).

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each Layer.
- Identify the different types of network devices and their functions within a network
- Understand and building the skills of subnetting and routing mechanisms.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.
- List and classify network services, protocols and architectures, explain why they are layered. Choose key Internet applications and their protocols, and apply to develop their own applications (e.g. Client Server applications, Web Services) using the sockets API.
- Explain various congestion control techniques.

Department of Computer Science & Engineering and Information Technology

INTERNET TECHNOLOGY & WEB DESIGNING (ELECTIVE-I)
CSL 705

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To describe Internet hardware components and their interaction, including server and client computers, hubs, switches and routers.
- To compare different guided and unguided media used to transmit Internet communications.
- To describe different data formats and file types available on the Internet.
- To describe Internet software components and their interaction, including clients and server software for web and e-mail.
- To compare features of different Internet navigation tools.
- To compare features of different Internet communication tools.
- To describe Internet providers and compare ways individuals and organizations obtain connections to the Internet.
- To develop an ability to design and implement static and dynamic website.

UNIT-I   Basics of Internet, Elements of Internet, Routers, Antennas, Gateways, Internet, Internet Links, Media Communication for Internet, VSAT, Global E-Mail, Browsing and Search Technologies, Search Engines, Web Browser, URL, Types of Browsers, Web Servers, Microsoft, Netscape and other Web Browser & Servers, Internet Protocols, Internet and The World Wide Web.

UNIT-II   User Experience Design:Basics UX TerminologyUXD in SDLC. Rapid prototyping in requirements, Client Tier using HTML5, basic HTML tags, Look and feel using CSS, client side scripting using java script (JS)and validations, Document object model(DOM), JQuery, ASP.

UNIT-III Business tier using POJO(Plain Old Java Object): Introduction to Frameworks, Introduction to POJO, Multithreaded Programming, Java I/O,JDBC.

UNIT-IV Presentation tier using JSP: Role of Java EE in Enterprise Applications, Basic of Servlets, To introduce server side programming with JSP, Standard tag library

UNIT-V Web Management: Fault Management, Configuration and Performance Management, System Management, Application and Service Management, Web-Based Enterprise Management

RECOMMENDED BOOKS
- Web-based Management, Harmedy (Prentice Hall).
- Web-Design, John McCoy (BPB Publications).

COURSE OUTCOMES

After completion of this course, the students would be able to:

An ability to understand the basic concepts of Internet programming and protocols used.

- Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
- Implement a Good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services.
- Get introduced in the area of Online Game programming.
- Ability to Internet-related careers and professions and the roles taken by members of a large web development team.
- Ability to access of files, including directories and URLs.

Department of Computer Science & Engineering and Information Technology

ADVANCE OPERATING SYSTEM
CSL801

L	T	P	C
3	1	2	6

COURSE OBJECTIVES

- To develop and apply knowledge of advance operating system techniques and methodologies.
- To gain experience in the design and development of advance operating system and advance operating system applications.
- To gain experience in the application of fundamental Computer Science methods and algorithms in the development of advance operating system and advance operating system applications.
- To gain experience in the design and testing of a large software system, and to be able to communicate that design to others.

Unit-I Review of operating system concepts such as Multiprogramming, Time sharing, Real time system, Off line – On line system, spooling, CPU scheduling, file handling etc. design aspects of single user and multi user (uni – processor) operating system.

Unit-II **Distributed operating system** Introduction, Goals, Hardware concepts software concepts, design issues, Transparency, flexibility, reliability, performance, scalability.

Unit-III **Communication in distributed system** Review of layered protocols, the client – server model, clients and servers addressing, Blocking VS Non blocking primitives, buffered vs un buffered primitives, Reliable vs unreliable primitives, remote procedure calls, Group communication, introduction, design issues.

Unit-IV **Synchronization in Distributed system** Clock synchronization : logical clock, physical clock, clock synchronization Algorithm. Mutual exclusion : centralize algorithm, A distributed algorithm, A token ring algorithms, atomic transactions, deadlock in distributed system.

Unit-V **Process and processors in Distributed systems** Introduction to threads, threads uses, Design issues. System model: The work station model, Idle work station, the

process pool model, hybrid model, processor Allocation scheduling in distributed system, distributed file system.

RECOMMENDED BOOKS

- Modern operating system, Tanenbaum
- Operating system : Design & implementation, Tanenbaum,
- Design of multiprocessor operating system, H. Josheph.
- Operating System. Concept design-11 Edn, Milenkouie

COURSE OUTCOMES

After completion of this course, the students would be able to:

1. Develop, test and debug RPC based client-server programs in Unix.
2. Design and build application programs on advance operating system.
3. Improve the performance and reliability of distributed application.
4. Design and build newer distributed file systems for any OS.
5. Demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
6. Learn the various resource management techniques for distributed systems

---

Practical List of Advanced operating System

(CSL-801)

1. Write a Program to print string using implements Runnable.
2. Write the Programs for Remote Procedure call.
3. Write the Programs for Remote Method Invocation.
4. Program to print 1 – 10 using Thread without Synchronization.
5. Write the Programs for Thread Programming in JAVA.
6. Program to print string using Extended Thread Class.
7. Implement CORBA file.
8. Write a Program to Increment a Counter in Shared Memory.
9. Implement Network File System (NFS).
10. Write a Program to implement RMI Time server.
11. Study of Web Service Programming.
12. Study of Grid Services using various Tools.
13. Write a Case Study of RPC.

Department of Computer Science & Engineering and Information Technology

DATA WAREHOUSE AND DATA MINING

CSL 802

L	T	P	C
3	1	2	6

COURSE OBJECTIVES

- To understand the value of data mining in solving real-world problems
- To understand foundational concepts underlying data mining
- To gain understanding of algorithms commonly used in data mining tools
- To develop ability for applying data mining tools to real-world problems

---

UNIT-I   **Introduction:** Motivation, important, Data type for data mining: relational databases, Data ware-houses. Transactional databases, advanced Database system and its Applications, Data Mining Functionalities Concept/Class description, Association Analysis classification & prediction, cluster Analysis, Outliner Analysis classification of data Mining Systems, Major issues in data mining.

UNIT-II   **Data Warehouse and OLTP Technology for Data Mining:** Differences between operational Database Systems, & Data warehouse, A multidimensional Data Model, Data warehouse Architecture, Data warehouse Implementation Data cube technology.

UNIT-III   **Data Pre processing:** Data cleaning, Data Integration and Transformation, Data reduction Discretization and Concept Hierarchy Generation. Data Mining Primitives Languages and system Architectures, Concept description, Characterization and comparison Analytical characterization.

UNIT-IV   **Mining Association rules in large databases:** Association rule Mining : Market Basket Analysis, Basic Concepts, Mining single Dimensional Boolean Association rules from Transactional databases : The Apriori algorithm,

Generating Association rules from frequent items, Improving the efficiency of Apriori, other algorithms & their comparison, Mining multilevel Association Rules, Multidimensional Association rules, constraint Based Association rule Mining.

UNIT-V   **Classification & Predication and cluster Analysis:** Issues regarding classification & predication, Different classification methods, Predication, cluster Analysis, Major clustering methods. Application & Trends in data mining: Data Mining Applications, Currently available tools, case study, current status.

RECOMMENDED BOOKS

- Han, Kamber : Data Mining : Concepts and Techniques (Morgan Kaufmann/Harcourt)
- A. K. Pujari, Data Mining Techniques, Universities Press Pvt. Ltd.

COURSE OUTCOMES

After completion of this course, the students would be able to:

- Display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them
- Evaluate models/algorithms with respect to their accuracy
- Demonstrate capacity to perform a self directed piece of practical work that requires the application of data mining techniques
- Critique the results of a data mining exercise
- Develop hypotheses based on the analysis of the results obtained and test them
- Conceptualize a data mining solution to a practical problem

---

DATA WAREHOUSE AND DATA MINING
CSL 802

1) To study of Weka data mining simulator.

2) To generate data set ARFF file (Attribute Related File Format) for data mining and apply various data mining algorithms on it, using data mining simulator.

3) Perform – Preprocessing, Classification, Visualization, Clustering and Association on generated data set.

4) Using Weka setting up to flow to load ab ARFF file and perform across validation on using J48.

5) Plotting multiple curves using J48 and random forest as classifier using Weka.

6) Training and Testing of naïve Bayesian, Incrementing with the help of Weka.

7) WAP to generate frequent item set from data set.

8) WAP to generate association rules from frequent item set using C/C++.

9) WAP to implement to Apriori Algorithm for frequent item set using C/C++.

Department of Computer Science & Engineering and Information Technology

NEURAL NETWORK AND FUZZY SYSTEM
CSL 803

L	T	P	C
3	1	2	6

COURSE OBJECTIVES

- To provide the student with the basic understanding of neural networks and fuzzy logic fundamentals, Program the related algorithms and Design the required and related systems.
- To understand the fundamental theory and concepts of neural networks, neuro-modeling, several neural network paradigms and its applications.
- To understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic.
- To deal with Introduction and different architectures of neural network

----

Unit-I   Introduction, Human Brain and Biological Neurons, Properties of Artificial Neural system, ANN. Training of Neural Networks, Perceptron and linear reparability.

Unit-II   Multilayer feedback networks, Back Propagation, Training Recurrent networks, Hopfield nets and energy function, statistical training methods and Boltsman machine. Counter propagation network architecture, operation, training of kohonen layer, training of gross berg layer, cauchy training.

Unit-III   Competitive learning, Architecture of ART, working of ART, Implementation and training of ART.

Unit-IV   Fuzziness probability: Fuzzy sets and systems, fuzzy entropy theorem, substheed theorem, entropy hobsethood theorem, Fuzzy associative memory, Fuzzy and neural Function entimators, fuzzy Hebb FAMs, Adaptive FAMS.

Unit-V   Fuzzy and Neural control systems, Comparison of Fuzzy and Neural systems,

Fuzzy image transform coding, Fuzzy controller, Kalman Filter Controller.

RECOMMENDED BOOKS

- Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications-S. Rajasekaran & G.A. Vijayalakshmi Pai, PHI.
- Introduction to Neural Networks Using Matlab 6.0, S. N. Deepa and S. N. Sivanandam, Tata McGraw-Hill
- Neural networks and fuzzy systems: a dynamical systems approach to machine intelligence-Bart Kasvo (PHI).
- Neural Networks and Learning Machines-Simon Haykin (PHI).

COURSE OUTCOMES

On successful completion of this module, students will be able to:

- Understand the differences between networks for supervised and unsupervised learning.
- Design single and multi-layer feed-forward neural networks.
- Develop and train radial-basis function networks.
- Program linear and nonlinear models for data mining.
- Analyze the performance of neural networks.

Department of Computer Science & Engineering and Information Technology

CELLULAR AND MOBILE COMMUNICATION

CSL 804

L	T	P	C
3	1	-	4

COURSE OBJECTIVES

- To understand the basics of wireless voice and data communication technologies.
- To study the elements of mobile communication and Cell concepts and assignment.
- To understand the mobile operating systems like android and its applications.
- To build working knowledge on various telephone and satellite networks.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

Unit I   Introduction to mobile communication System: Basic mobile system, features and standards, concept, Performance criteria, Uniqueness of mobile radio environment. Operation of Mobile radio and cellular radio, planning of mobile system, frequency plans, Elements of mobile communication: site setup, Mobile radio, Antennas and their parameter. Planning of mobile system, frequency plans

Unit II   Elements of mobile communication: site setup, Mobile radio, Antennas and their parameter, Cell concepts, Cell splitting, cell Sectorizations and planning, Frequency management and channel assignment, channel planning, frequency reuse, co-channel, Interference: co channel and adjacent channel reduction techniques, fading models, Diversity reception.

Unit III   Introduction to mobile operating system, Operating system structure, Constraintsand Restrictions, Hardware configuration with mobile operating system, Features: Multitasking scheduling, Memory allocation, File system interface, Keypad Interface, I/O Interface, Protection and security, Multimedia features. Introduction to mobile development IDE's , Introduction to Work light basics, Optimization, Pages and fragments Client Technology, Client side

debugging, Creating adapter, Invoking adapter from working client application, Common controls using java in adapters, Programming exercise with Skins, Understanding Apache Cordova, Offline access , Encrypted cache deprecated, using JSONStore

Unit IV   Introduction to architecture, Memory management, Communication protocol, Application development, Deployment on Apple iOS, Android, Windows phone applications using development platforms e.g. Worklight, Kendo, Appoon, Xcode, Xpages Understanding and implementing shell development, Creating JAVA ME Application, Exploring the work light server, Understanding device analytics, Working with UI frameworks, Authentication, Push notification, SMS notification, Globalization, WebView overlay, Creating authentication application: Development for Apple iOS by using a login module, Hand off/Handover, Call evaluation, Cellular traffic terminology in traffic theory, Channel assignment schemes, Various flow diagrams for call setup and control setup, Channel capacity : Voice and control, Network access techniques : FDMA, TDMA, Cell enhancers.

Unit V   Introduction to GSM and CDMA, Introduction to WLANs, Benefits of WLANs,Design and principles of operation, Type of WLANs, Standards IEEE 802.11, 802.11b, Wireless application protocol : Design and principle of operation, WAP architecture requirements, WAP architecture overview, The WAP model, WAP architecture components, Compliance and Interoperability, Bluetooth, Mobile IP, Mobile-TCP, Introduction to sensor network.

RECOMMENDED BOOKS
- Cellular & mobile communication-W.C. Y. lee(Mc Graw-Hill)
- Wireless Digital Communication- Dr. K Father (PHI)
- Mobile Communication- Jochen Schiller (Pearson)
- Wireless Communication & Networking - William Stalling (PHI)

COURSE OUTCOMES

After completion of this course, the students would be able to: