

**GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
KUMBAKONAM**

Department of Computer Science

Programme : B.Sc., Computer Science

Programme Code : USCS



SYLLABUS

2021 – 2022 – I Year

2022 – 2023 – II Year

2023 – 2024 – III Year

i. Programme Outcomes :

On the completion of the B.Sc Computer Science students are able to work as : Programmer / Software Engineer / Web-Designer / System Administrator / Data Entry Operator / Software Testing Engineer / IT Officer / Multimedia Designer.	
PO 1	An ability to apply knowledge of Computer Science to analyze problems with strong knowledge of practical and theoretical concepts and to provide effective solutions.
PO 2	Identify, Analyze and formulate solutions to computing problems and compare alternative solutions to computing problems.
PO 3	An ability to apply design and development principles in the implementation of software systems.
PO 4	Adopt to latest trends in the IT industries
PO 5	To provide sound academic knowledge in Technical, analytical and creative skills and also gain new ideas to acquire employability and self-employment.
PO 6	Recognize the social and the Ethical responsibilities of a professional working in the discipline.
PO 7	Participate in Life-Long learning to enhance knowledge and skills necessary to contribute to the betterment of professions.

ii. Programme Specific Outcomes :

A graduate with B.Sc Computer Science will have the ability to	
PSO 1	Impart an understanding fundamentals theoretical an practical concepts on the area of Computer Science.
PSO 2	An ability to use current technologies and tools for programming practically.
PSO 3	An ability to apply design and development principles in the implementation of software systems.
PSO 4	Entrusting student interests in building their career in the field of IT by providing the latest technologies.
PSO 5	Recognize the social and the Ethical responsibilities of a professional working in the discipline
PSO 6	Apply problem solving skills and the knowledge of computer science to solve real-world problems possess employability and entrepreneurship skills.

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS) KUMBAKONAM

(Curriculum – B.Sc., COMPUTER SCIENCE – 2021 - 2022)

Department : COMPUTER SCIENCE

Programme Code: USCS

SEMESTER – I

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC	U211T1	Tamil	6	3	3	25	75	100
II	ELC	U211E1	English	6	3	3	25	75	100
III	CC – I	U21CSC101	Programming in C	6	5	3	25	75	100
III	CC – II	U21CSC102P	Practical - Programming in C Lab	3	2	3	40	60	100
III	AC - I	U211AM1:CS	Numerical Methods	5	4	3	25	75	100
III	AC -II	U212AM2:CS	Operations Research	2	-	-	-	-	-
IV	AEC	U211VE	Value Education	2	2	3	25	75	100
Total				30	19				600

SEMESTER – II

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC	U212T2	Tamil	6	3	3	25	75	100
II	ELC	U212E2	English	6	3	3	25	75	100
III	CC – III	U21CSC203	Object Oriented Programming with C++	6	5	3	25	75	100
III	CC – IV	U21CSC204P	Practical – Programming in C++ Lab	3	2	3	40	60	100
III	AC -II	U212AM2:CS	Operations Research	2	4	3	25	75	100
III	AC - III	U212AM3:CS	Probability and Statistics	5	4	3	25	75	100
IV	AEC	U212ES	Environmental Studies	2	2	3	25	75	100
Total				30	23				700

SEMESTER – III

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC	U213T3	Tamil	6	3	3	25	75	100
II	ELC	U213E3	English	6	3	3	25	75	100
III	CC V	U21CSC305	Fundamentals of Data Structures and Algorithms	6	5	3	25	75	100
III	CC VI	U21CSC306P	Practical – Data Structures using C++ Lab	3	2	3	40	60	100
III	AC – IV	U213AAPH1	Applied Physics - I	5	4	3	25	75	100
III	AC- V	U214AAPH2P	Practical - Applied Physics – II (Carry Over)	2	--	--	--	--	--
IV	NMEC – I	U21CS3NME1:1	Fundamentals of Photoshop Lab	2	2	3	40	60	100
		U21CS3NME1:2	Office Automation Lab						
Total				30	19				600
	SSC - I	U213SS1	Mathematics Aptitude for Recruitment Board Examinations	-	2	2	-	100	100

SEMESTER – IV

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
I	LC	U214T4	Tamil	6	3	3	25	75	100
II	ELC	U214E4	English	6	3	3	25	75	100
III	CC -VII	U21CSC407	Programming in Java	5	5	3	25	75	100
III	CC – VIII	U21CSC408P	Practical – Programming in Java Lab	3	2	3	40	60	100
III	AC - V	U214AAPH2P	Applied Physics Practical –II	2	4	3	40	60	100
III	AC - VI	U214AAPH3	Applied Physics – III	4	4	3	25	75	100
IV	NMEC– II	U21CS4NME2:1	E – Commerce	2	2	3	25	75	100
		U21CS4NME2:2	Internet Programming						
IV	SEC – I	U214CSSE1	Computer Applications in MS Office - Lab	2	2	3	40	60	100
Total				30	25				800
	SSC – II	U214SS2	Social Study for Competitive Examinations	-	2	2	-	100	100

SEMESTER – V

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
III	CC – IX	U21CSC509	Operating Systems	5	5	3	25	75	100
III	CC – X	U21CSC510	Computer Architecture & Fundamentals of Microprocessor	5	5	3	25	75	100
III	CC – XI	U21CSC511	Data and Computer Communications	5	5	3	25	75	100
III	CC – XII	U21CSC512P	Practical – Microprocessor Lab	6	4	3	40	60	100
III	MBEC – I	U21CS5MBE1:1	Computer Graphics	5	5	3	25	75	100
		U21CS5MBE1:2	Multimedia Systems						
		U21CS5MBE1:3	Digital Image Processing						
IV	SEC – II	U215CSSE2	Fundamentals of Photoshop - Practical	2	2	3	40	60	100
IV	SEC –III	U215CSSE3	Job Interview Skills - Theory	2	2	3	25	75	100
Total				30	28				700

SEMESTER – VI

Part	Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks		
							CIA	ESE	Total
III	CC – XIII	U21CSC613	Data Base System Concepts	6	5	3	25	75	100
III	CC – XIV	U21CSC614	PHP Scripting Language	6	5	3	25	75	100
III	CC – XV	U21CSC615P	Practical – Programming in PHP Lab	6	4	3	40	60	100
III	MBEC – II	U21CS6MBE2:1	Software Engineering	6	5	3	25	75	100
		U21CS6MBE2:2	System Analysis Design						
		U21CS6MBE2:3	Software Project Management						
III	MBEC– III	U21CS6MBE3:1	Internet of Things	5	5	3	25	75	100
		U21CS6MBE3:2	Cyber Security						
		U21CS6MBE3:3	Social Computing						
V	AEC	U216GS	Gender Studies	1	1	3	25	75	100
V		U21EA	Extension Activities	-	1	-	-	-	-
Total				30	26				600

**COURSE STRUCTURE ABSTRACT FOR
B.Sc., PROGRAMME 2021-2022 ONWARDS**

Part	Course		Total No. of Papers	Hours	Credit	Mark
I	Language Course (LC)		4	24	12	400
II	English Language Course (ELC)		4	24	12	400
III	Core Course (CC)		15	74	61	1500
III	Allied Course (AC)		6	27	24	600
III	Major Based Elective Course (MBEC)		3	16	15	300
IV	Non Major Elective Course (NMEC)		2	4	4	200
IV	Skill Enhancement		3	6	6	300
IV	Ability Enhancement Course (AEC)	Value Education	1	2	2	100
IV		Environmental Studies	1	2	2	100
V		Gender Studies	1	1	1	100
V	Extension Activities		--	0	1	---
Total			40	180	140	
Extra Credit Courses						
Self Study Course (SSC)			2	-	4	200
Total			42		144	4200

Semester – I - Core Paper – I – CC - I

Programming in C

Theory Hours	: 6	Course Code	: U21CSC101
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To obtain knowledge about the structure of the programming language C and to develop the program writing and logical thinking skill.

UNIT I

Overview of C - History of C - Importance of C - Sample Programs - Basic Structure of C Programs - Programming Style - Executing a 'C' Program Constants, Variables, and Data Types Introduction - Character Set - C Tokens - Keywords and Identifiers – Constants – Variable - Data Types - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variable - Defining Symbolic Constants - Declaring a Variable as Constant - Declaring a Variable as Volatile - Overflow and Underflow of Data Operators and Expressions : Introduction - Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operators - Bitwise Operators - Special Operators - Arithmetic Expressions- Evaluation of Expressions - Precedence of Arithmetic Operators - Type Conversions in Expressions - Operator Precedence and Associativity - Mathematical Function.

UNIT II

Managing Input and Output Operation - Introduction - Reading a Character - Writing a Character - Formatted Input - Formatted Output - Decision making and Branching - Introduction Decision Making with IF Statement - Simple IF Statement - The IF....ELSE Statement - Nesting of IF.....ELSE Statement - The ELSE IF Ladder - The Switch Statement - The ?: Operator - The GOTO Statement - Decision Making and Looping- Introduction - The WHILE Statement- The DO Statement- The FOR Statement - Jumps in LOOPS - Concise Test Expressions.

UNIT III

Arrays – Introduction - One-dimensional Arrays - Declaration of One-dimensional Arrays Initializing of One - dimensional Arrays - Two - dimensional Arrays - Initializing Two - dimensional Arrays - Multi-dimensional Arrays - Dynamic Arrays - More about Arrays - Character Arrays and Strings - Introduction - Declaring and Initializing String Variables- Reading String from Terminal- Writing Strings to Screen - Arithmetic Operation on Characters - Putting Strings Together - Comparison of Two Strings - String-handling Function - Table of Strings - Other Features of Strings.

UNIT IV

User-defined Functions- Introduction - Need for User-defined Function- A multi-function Program- Element of User-defined Function - Definition of Functions - Return Values and their Types - Function Calls - Function Declaration - Category of Functions - No Arguments and no Return Values - Arguments but no Return Values - Argument with Return Values- No Arguments but Returns a Value - Function that Return Multiple Values - Nesting of Function - Recursion - Passing Arrays to Functions - Passing Strings to Functions - The Scope, Visibility and Lifetime of Variables - Multi file Programs - Structures and Unions - Introduction - Defining a Structure - Declaring Structure Variables - Accessing Structure Members Copying and Comparing Structure Variables - Operations on Individual Members Arrays of Structures - Arrays within Structures - Structures within Structures - Structures and Function – Unions - Size of Structures - Bit Fields.

UNIT V

Pointers - Introduction - Understanding Pointers - Accessing the Address of a Variable Chain of Pointer - Pointer Expressions - Pointer Increment and Scale Factor - Pointer and Arrays Pointers and Character String - Array of Pointers - Pointers as Function Arguments - Functions Returning Pointer - Pointers to Function - Pointer and Structures - Troubles with Pointer. **File Management in C** - Introduction - Defining and Opening a File - Closing a File - Input / Output Operations on File - Error Handling During I/O Operations - Random Access to Files Command Line Arguments.

Text Book :

“Programming in C” – E. Balagurusamy - 4th edition - Tata McGraw – Hill Publishing company.

Reference Book :

“ Programming with C ” – schaum series - 2nd Edition - Byron S.Gottfried.

Course Outcome :

- Students learn about the, fundamental of programming language. Know the concept of variable, data types, operators, Expressions.
- Know the concept of control structures and Looping statements.
- Learn to create arrays and its types. They learn about functions, strings and storage classes.
- To know about how to pass pointers to fun
- ctions.
- Gain the knowledge about structure and files. Learn to create file, operations on file, command line arguments in C.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – I - Core Practical I – CC - II

PROGRAMMING IN C LAB

Theory Hours	: -	Course Code	: U21CSC102P
Practical Hours	: 3	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To obtain knowledge about C programming concepts.

List of Practicals :

1. Reverse a given five digit number.
2. Income Tax calculation using nested IF.
3. Prime number checking.
4. Sum of digits of a given number.
5. Printing Pascal Triangle.
6. Solution of a Quadratic Equation (all cases).
7. Sum of Series (Sine, Cosine, e (Pow) x).
8. Palindrome checking.
9. Ascending and Descending order of numbers using Arrays(Use it to find Largest and Smallest Numbers)
10. Sorting of names in Alphabetical order.
11. Matrix Operations (Addition, Subtraction, Multiplication – use Functions)
12. Finding factorial of a given number using recursive function.
13. Generating Fibonacci Numbers using recursive function.
14. String manipulations without using string functions (String length, String Comparison, String Copy, Palindrome checking, Counting words and lines in strings – use function pointers).
15. Calculate no.of positive , no.of negative and zero number in an array.
16. Number sorting using pointers.
17. Printing maximum marks in each subject along with the name of the student by using structure.
18. Pay bill calculation using file.
19. Counting no.of words, lines and characters using files.
20. Adding given numbers using command line arguments.

Course Outcome (COs):

- Develop programs for a given problem using the concept of conditional and looping statements.
- Develop programs for implementation of Arrays, Function.
- Construct programs and perform Matrix Operations.
- Gain skills to write programs using String functions, Structures and Files.
- Develop programs using Graphics concept.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

tpOkpa fy;tp (VALUE EDUCATION)

Theory Hours	: 2	Course Code	: U211VE
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 25 75

Unit I – Kd;Diu : tpOkpaf; fy;tp

- 1) tho;tpay; tpOkpaq;fs;
- 2) tpOkpaq;fspd; tiffs;
- 3) tho;tpay; tpOkpaq;fis ghjpf;Fk; fhuzpfs;
- 4) tpOkpaf; fy;tpapd; mtrpak;

Unit II – ed;dlj;ijfs;

- 1) ngw;Nwhiu kjpj;jy;
- 2) Mrphpaiu kjpj;jy;
- 3) ,iw topghL
- 4) Rakjpg;G

Unit III – r%fk; rhh;ej kjpg;Gfs;

- 1) xw;Wik
- 2) rkj;Jtk;> rNfhuj;Jtk;
- 3) FLk;gk;
- 4) Fbkf;fspd; flikfs;> Njrgf;jp

Unit IV – cly; eyk; & kd tsk;

- 1) czT xOf;fk;
- 2) jdp kdpj Rfhjhuk;
- 3) kfsph; MNuhf;ak;
- 4) vz;zq;fspd; typik

**Unit V – rPh;NfLfSk;> rPh;jpUj;jq;fs;
rPh;NfLfSk;**

- 1) tho;f;if tpOkpaq;fs; kw;Wk; mwq;fs; cyfkakhjypd; ghjpg;G
- 2) Clfq;fspd; ghjpg;G
rPh;jpUj;jq;fs;:
- 3) kdf;fl;Lg;ghL> tpUg;gq;fis newpg;gLj;jy;
- 4) clw;gapw;rp> jpahdk;> Nahfh.

Section A - 5 x 15 = 75 (From each Unit 2 Question with Either OR type)

Semester – II - Core Paper III – CC - III

OBJECT ORIENTED PROGRAMMING WITH C++

Theory Hours	: 6	Course Code	: U21CSC203
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To gain the basic knowledge of object oriented programming concepts and to understand the detail idea of C++ streams, templates and error handling concepts of C++ programming.

UNIT I

Object oriented programming: Software Evolution – OOP Paradigm – concepts, Benefits, Object Oriented Languages and Applications.

UNIT II

Introduction to basic concepts of C++ Languages – Tokens, keywords, Identifiers, Data Types, Variables, Manipulators – Expression and Control Structures – Functions: main function – function prototyping – Call by Reference – Function Overloading – Friend and Inline functions.

UNIT III

Classes and Objects – Constructors and Destructors – Operator Overloading – Type Conversions.

UNIT IV

Inheritance – single Inheritance – Multiple Inheritance – Hierarchical, Hybrid Inheritance – Polymorphism – Pointers – Virtual Functions – Console I/O operations.

UNIT V

Files – Classes for file stream operations – Opening, Closing and Processing files – End of file Detection – File pointers – Updating a file – Error Handling during file operations – Command line Arguments – Templates – Exception Handling.

Text Book :

“OBJECT ORIENTED PROGRAMMING WITH C++” – E. BALAGURUSAMY TATA McGraw Hill Publishing Ltd, New Delhi, 1995.

Reference Books :

- 1."OBJECT ORIENTED PROGRAMMING WITH C++" – Robert Lafore.Galgotia,1994.
2. "C++, The Complete Reference"–Herbert Schilt, 3rdEdition, Tata McGraw Hill Publishing Ltd,1999.
3. "Let us C++" – Yeswant Kanetkar, BPB Publication, 1999.
4. Programming with C++ - John R. Hubbard – Schaum's Outline Series,1996.

Course Outcomes (COs):

- To learn the object oriented programming(OOP), concepts such as abstraction, encapsulation, polymorphism, overloading, inheritance and generic programming
- Describe the concepts of inheritance, pointers and virtual functions.
- To understand the concepts of files, templates and exception handling.
- Develop skills to write C++ Programs using to OOPS concepts.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – II - Core – IV – CC - IV

PROGRAMMING IN C++ LAB

Theory Hours	: -	Course Code	: U21CSC204P
Practical Hours	: 3	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To Develop skills to write C++ Programs using to OOPS concepts.

List of Practicals :

1. Election Candidate problem.
2. Function overloading and default value to a parameter.
3. Write a C++ program using a class to represent a bank Account with data members – name of depositor, account number, type of account, balance and member functions – deposit amount, withdraw amount, show name and balance. Check the program with your own data.
4. Consider a shopping list of items for which orders are placed with a dealer. The list should include code number and price the item. Operations such as adding an item to the list, deleting an item from the list and printing the total value of the order are to be provided. Write a program to implement the above using a class with arrays as data members.
5. Create a ‘time’ class with integer data members hours, minutes, and seconds. Develop two constructors, one should initialize the data to zero and the other should initialize to fixed values. A member function should display it in hh:mm:ss format.
6. Design an abstract base class ‘Shapes’ and derive three classes “Rectangle”, “Circle”, and “Triangle”. Develop Polymorphic Functions “Circumference” and “Computer Area”, to calculate the circumference and area of these objects and display is. Develop a main program to create each of these objects and apply these polymorphic functions.
7. Develop a program using operator overloading
 - a) To add two complex numbers.
 - b) To find the difference between any given time and the system time.
 - c) To multiply two matrices.
8. Class inheritance for a publishing company.

9. Simulation of a calculator using function overloading.
10. Income Tax calculation using virtual function.
11. Write a program which reads a text from a file and the display the following information
Number of Lines
Number of Words
Number of Characters
Strings should be left justified and numbers should be right justified in a suitable field width.
12. Write a C++ programs to illustrate the use of the following
Default argument
Reference Variable
Copy Constructor
Develop a “Employee” class having the data members Empno, Ename, Basic pay, Dept and Grade. Calculate the DA, HRA, LIC AND PF (Assume your own data and Percentage). Using these calculate Gross pay and Net Pay.

Course Outcomes (COs):

- To understand and implement OOPS concepts using C++.
- To apply OOPS concepts in problem solving.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester – II - AEC

ABILITY ENHANCEMENT - ENVIRONMENTAL STUDIES

Theory Hours	: 2	Course Code	: U212ES
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE

UNIT – I

The Multidisciplinary Nature of Environmental Studies

- Definition, Scope and Importance
- Need for public awareness
- Natural Resources
- Renewable and Non- Renewable Resources
- Natural Resources and associated Problems

UNIT – II

Biodiversity and its Conservation

- Introduction – Definition : genetic, species and ecosystem diversity
- Biodiversity at global, national and local levels
- India as a mega – diversity nation
- Hot – Spots of biodiversity
- Conservation of Biodiversity : In- Situ and Ex- Situ Conservation of Biodiversity

UNIT – III

Environmental Pollution Definition

- Causes, Effects and Control Measures of :
 - a. Air Pollution - Climate Change, global warming , acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
 - b. Water Pollution
 - c. Soil Pollution
 - d. Marine Pollution
 - e. Noise Pollution
 - f. Thermal Pollution
 - g. Nuclear hazard (Radioactive pollution)
- Solid Waste Management : Causes , Effects and Control measures of urban and Industrial Wastes
- Role of an individual in Prevention of Pollution
- Disaster Management : Floods, Earthquake, Cyclone and landslides.

UNIT – IV

Social Issues and the Environment

- From Un - Sustainable to Sustainable development
- Urban Problems related to energy
- Water Conservation, rain water harvesting, Watershed Management
- Resettlement and rehabilitation of People: its problems and concerns case Studies.

- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
- Wasteland reclamation
- Consumerism and waste products
- Environment Protection Act
- Air (Prevention and Control of Pollution) Act
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness.

UNIT – V

Human Population and the Environment

- Population growth, Variation among nations
- Population explosion - Family Welfare programme.
- Environment and Human Health
- Human Rights
- HIV/ AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

Effects of Fireworks

- Man, Environment and Climate Change – Firework and Celebrations – Fireworks and Health Hazards – Types of Fire – Types and Use of Fire Extinguishers – Firework and Safety – Creating Awareness on Reducing the Usage of Fireworks.
- Case Studies.

Question Paper Pattern

Section A - 5 x 15 = 75 (From each Unit 2 Question with Either OR type)

Semester III - Core Paper –V – CC - V

FUNDAMENTALS OF DATA STRUCTURES AND ALGORITHMS

Theory Hours	: 6	Course Code	: U21CSC305
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To give a fundamental knowledge on data structures and exposure to development of algorithms related to data structures.

UNIT I

Arrays and sequential Representations – Ordered Lists – Stacks and Queues – Evaluation of Expressions – Multiple Stacks and queues – singly Linked Lists – Linked Stacks and Queues – Polynomial Addition – Doubly Linked Lists and Dynamic Storage Management – Strings – a case study.

UNIT II

Trees – Binary tree representations – Tree Traversal – Threaded binary trees – Binary tree representation of trees – Set representations – Decision trees .

UNIT III

Graphs and Representations – Traversal, Connected Components and spanning trees – Shortest paths and transitive Closure .

UNIT IV

Algorithms – conventions – Writing Structured Program – Analyzing algorithms – Sorting – Heap sort – Binary search – Finding the maximum and minimum – Merge sort – Quick sort – Selection sort.

UNIT V

Greedy Method: The general method – Optimal storage on tapes – knapsack problem – Job sequencing with deadlines – Optimal merge patterns – Minimum spanning trees – single source shortest paths.

Text Books :

Fundamentals of data structure – Ellis Horowitz and Sartaj Sahini Chapters 2,3,4,5,6.1 to 6.3 (Excluding 2.3,3.2,4.5,4.6,5.8.3,5.9,4.7,4.10,4.12,6.4,6.5).

Fundamental of Computer Algorithms – Elliz Horowitz and sartaj sahini Galgotia Publications.

Reference Books :

1. Data Structures – LIPSCHUTA, Tata McGraw Hill, Schaum's Outline Series.
2. Introduction to Design & Analysis of Algorithms–Goodman(S.E), Hedetniemi (S.T).

Course Outcomes (COs):

- To give a fundamental knowledge on data structures and exposure to development of algorithms related to data structures.
- Choose an appropriate data structure and algorithm design method for a specified problem design.
- Assess how the choice of data structure and algorithm design methods impacts the performance of program.
- Implement operations like searching, insertion and deletion traversing mechanism etc. on various data structures such as stack queue and linked list.
- Implement non-linear data structures are tree and graphs for a specified applications.
- Implement appropriate sorting searching technique for a given problem analyze the complexity of given algorithms.
- Solve problems using algorithm design methods such as the divide and conquer and dynamic programming and writing programs for these solutions.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester III - Core VI – CC-VI

DATA STRUCTURES USING C++ LAB

Theory Hours	: -	Course Code	: U21CSC306P
Practical Hours	: 3	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To write an execute program in C++ to solve problems using data structures such as arrays, linked lists, stacks, queues, trees and graphs.

To implement various sorting and searching algorithm.

To gain knowledge in practical applications of data structures.

List of Practicals :

1. Write a program to merge two arrays into single array.
2. Write a program to implement stack using array.
3. Write a program to implement queue using array.
4. Write a program to implement postfix evaluation.
5. Write a program to insert and delete an element in a linked list
6. Write a program to implement polynomial addition using linked list.
7. Write a program to implement double linked list.
8. Write a program to implement binary tree
9. Write a program to implement breadth first search.
10. Write a program implement depth first search.
11. Write a program to find an element using Sequential search.
12. Write a program to find an element using Binary search.

13. Write a program to implement quick sort.
14. Write a program to implement selection sort.
15. Write a program to implement insertion sort.

Course Outcomes (COs):

- Programs to demonstrate the implementation of various operations on different ADTS such as stacks, queues and linked list.
- Programs to demonstrate Tree Traversal, Graph traversal and shortest paths.
- Implement various searching and sorting algorithms.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester III - NMEC - I

PART – IV - NON MAJOR ELECTIVE COURSE

1. FUNDAMENTALS OF PHOTOSHOP LAB

Theory Hours	: 2	Course Code	: U21CS3NME1:1
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To give a fundamental knowledge on data structures and exposure to development of algorithms related to data structures.

UNIT I

Photoshop: Introduction, Photoshop Program Window- Creating a New File, Saving a File. Working with Image: Image Size, Image Resolution, Editing Images, Color Mode, Setting the Current Foreground and Background Colors.

UNIT II

Making and Selections: Making Selection - Moving Portion of an Image – Transforming Selections

UNIT III

Painting and Drawing Tools: The Painting Tools- The Brush Tool, The Pencil Tool, The Color Replacement Tool, The History Brush Tool, The Art History Brush Tool, The Gradient Tool. The Drawing Tools – The Rectangle Tool, The Custom Shape Tool, The Freeform Pen Tool.

UNIT IV

Layers: Layers Palette – Working with Layers – New Layer via Cut – New Layer via Copy – Hiding / Showing Layers – Flattening Images- Working with Adjustment Layers – Layer Effects.

UNIT V

Filters : The Filter Menu – Filter Gallery – Extract Filter – Liquify Filter – Vanishing Point Filter – Artistic Filters – Blur Filters – Brush Stroke Filters – Distort Filters – Noise Filters – Pixelate Filters – Lighting Effects – Difference Clouds – Sharpen Filters – Sketch Filters – Stylize Filters – Other Filters.

Text Book :

Comdex DTP Course Kit by Vikas Gupta Published by Dream Tek Press.

Reference Book :

- “ Adobe Photoshop ” CS by Bakkianathan
- Teach Yourself Adobe Photoshop Rose Carla Adobe Photoshop Cs Classroom in a Book by Adobe Pres

Course Outcomes (COs):

- To impart the knowledge about the Photoshop in order to improve the employability skills of the learners.
- To get basics idea on working with images and colors.
- To learn how to select and more an image.
- To know how to paint and draw an image using various custom tools.
- To get practical knowledge about layer effect.
- To know the uses of various filters.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester III - NMEC - I

PART – IV - NON MAJOR ELECTIVE COURSE

2. OFFICE AUTOMATION LAB

Theory Hours	: 2	Course Code	: U21CS3NME1:2
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To learn the basic knowledge of MS Word, Excel and Powerpoint

UNIT I

Introduction to Word Basics : Introduction – What is word processing ? – Features and advantages of word processing – word basics – keyboard operations.

UNIT II

Tabs, Commands, Tool bars and their icons : The Ribbon – Tabs and Groups: File Tab – Home Tab – Insert Tab – Designing Tab – Page Layout Tab – Reference Tab – Mailing Tab – Review Tab – View Tab.

UNIT III

MS – Excel: Introduction – What is SpreadSheet? – Creating and Editing simple Wworksheets – Starting Excel – Navigating – Seecting Cells – Selecting Cells with the Mouse – Entering and editing text – Entering numbers – Entering formulae – Entering dates - Alignments.

UNIT IV

Menus, commands and tool bars – The ribbons – tabs and groups: File Tab – Home Tab – Insert Tab – Page Layout Tab – Formulas Tab – Data Tab – Review Tab – View Tab – Power Pivot Tab.

UNIT V

MS – Powerpoint: Introduction – Navigating in powerpoint – working with powerpoint in different views.

Text Books :

1. A First Course in Computers based on Windows 8 and MS-Office 2013 by Sanjay Saxena –Vikas Publishing House Pvt Ltd.
Unit I & II – Chapter 4
Unit III & IV – Chapter 5
Unit V – Chapter 6

Reference Book :

- Alex Leon, Mathew Leon, “Introduction to Computers”, Vikas Publishing, 2008.
- Diane Koers, Microsoft Office XP- fast & easy” Prentice Hall of India Private Limited, New Delhi, 2001

Course Outcomes (COs):

- To get the basic ideas of MS Office including Word, Excel & Powerpoint.
- To create documents, parts of word window and keyboard operations.
- To learn the tabs, commands, tool bars and their icons of MS Word.
- To describe the concepts of MS Excel basics such as spreadsheets, creating and editing worksheets and menus, commands, tool bars.
- To acquire the knowledge about MS Powerpoint including creating presentations, the ribbon tabs and groups and working with different views.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester IV – Core Paper – VII – CC-VII

PROGRAMMING IN JAVA

Theory Hours	: 5	Course Code	: U21CSC407
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To give basic knowledge of Object Oriented Programming paradigm and to impart the programming skills in JAVA.

UNIT I

Java Evolution: Java History – Java Features – How Java Differs from C and C++ - Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Support Systems – Java Environment - Overview of Java Language: Introduction – Simple Java Program – More of Java – An Application with Two Classes – Java Program Structure – Java Tokens – Java Statements – Implementing a java program – Java virtual machine – Command line arguments – Programming Style – Constants, Variables and Data types: Introduction – Constants – Variables – Data Types – Declaration of Variables – Giving values to variables – Scope of variables – Symbolic Constants – Type casting – Getting values of Variables – Standard default values.

UNIT II

Operators and Expressions: – Arithmetic operators – Relational Operators – Logical Operators – Assignment Operators – Increment and decrement operators – Conditional operators – Bitwise Operators – Special operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Type conversion in Expressions- Operator Precedence and Associativity – Mathematical Functions – Decision making and branching - Decision making and Looping.

UNIT III

Classes, Objects and Methods: Defining a class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static members – Nesting of methods – Inheritance: Extending a class – Overloading Methods – Final Variables and methods – Final Classes – Finalizer Methods – Abstract methods and classes – Methods with Varargs – Visibility Control- Arrays, Strings and Vectors: Introduction – One Dimensional Arrays – Creating an Array – Two – dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types – Annotations – Interfaces: Multiple Inheritance – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface variables.

UNIT IV

Packages - Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing A package – Using a Package – Adding a class to a package – Hiding classes - Static Import – Multithreaded Programming : Creating Threads – Extending the Thread class – Stopping and Blocking a Thread – Life cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the “Runnable” Interface – Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch statements – Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.

UNIT V

Applet Programming : How applets differ from Applications – Preparing to write applets – Building applet code – Applet life cycle – Creating an Executable applet – designing a web Page – Applet Tag – Adding Applet to HTML File – Running the applet – More about Applet Tag – Passing parameters to applets – Aligning the display – More about HTML tags - Displaying Numerical values – Getting input from the user – Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control loops in applets – Drawing bar charts. Managing Input/Output Files in Java: Concept of Streams – Stream classes - Byte Stream Classes – Character stream classes – using streams – other useful I/O classes – Using the file Class – Input / Output Exceptions – Creation of Files – Reading/Writing characters – Reading/Writing Bytes – Handling primitive data types – Concatenating and Buffering files – Random access files – Interactive input and output – other stream classes.

Text Book :

“Programming with Java”– E.Balagurusamy, Tata McGraw Hill Publishing Company Ltd,3rdEdition.

Reference Book :

Java 2 Complete Reference”, Herbert Schildt,Tata Mc Graw HILL, 4th Edition.

Course Outcomes (COs):

- To give basic knowledge of Object Oriented Programming paradigm and to impart the programming skills in JAVA.
- Knowledge on the basic java language features, types and control structures.
- Use the java programming language for various programming technologies.
- Understand the idea inheritance and packages. Propose the use of certain technology by implementing them in the Java programming language to solve the given problem.
- Know exception handling, threads are used to perform sub tasks and interthread communication.
- Develop applications using an applet will be able to graphics using AWT.
- Develop software in the programming language.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25(From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester IV – Core Practical – VIII – CC-VIII

PROGRAMMING IN JAVA LAB

Theory Hours	: -	Course Code	: U21CSC408P
Practical Hours	: 3	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To give basic knowledge of Object Oriented Programming paradigm and to impart the programming skills in JAVA.

List of practicals :

1. Simple programs using For, While, Ternary and Switch
2. String handling using String and String Buffer.
3. Inheritance
4. Polymorphism
5. Interfaces and packages
6. Text files (Copy, Display, counting characters, words and lines)
7. Data Files (Creating, Processing)
8. Vector manipulation
9. Simple Programs Applet and AWT
10. Exercises using Predefined and User Defined Exception
11. Graphics Programs for drawing Lines, Rectangle, Oval, String using Applet.

Course Outcomes (COs):

- Understand the Java programming Language in the aspects of designing coding and implementation.
- Know about new ideas of interfaces, packages, exception handling and multithreading techniques are used them effectively.
- To develop applications using Applets and Event Handling.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester IV – NMEC - II

PART – IV - NON MAJOR ELECTIVE COURSE

1. E – COMMERCE

Theory Hours	: 2	Course Code	: U21CS4NME2:1
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To give the concepts of E-Commerce and their applications of Business.

UNIT I

Introduction to Electronic Commerce : What is Electronic Commerce ? – Benefits of Electronic Commerce – Impact of Electronic Commerce - Applications of Electronic Commerce Technologies.

UNIT II

E-Commerce in India – E- Commerce in banking – Electronic Payments – Online Business.

UNIT III

Electronic Credit Cards - Electronic Data Interchange(EDI) – Supply Chain Management – Payment Security – Computer Crimes.

UNIT IV

Electronic Commerce: Search Engines and Directory Services – Internet Advertising.

UNIT V

Cyber Laws : Privacy protection Act – Electronic Communication Privacy Act - Electronic Communication Service –Digital Signature method of the Recognition – Keypair method of Recognition – Arrest without warrant – Recognition of Electronic records – Indian IT Acts – USA Privacy Policy – Taxation of E-Commerce – Information Technology Act -2000 – Information Technology Security guidelines – Information Technology Acts – 2003.

Text Books :

1. Electronic Commerce – Bharat Bhaskar – The MCGrawhill Second edition. (Unit I &IV)
2. Internet & E-Commerce – C. Nellai Kannan (Units – II, III & V).

Reference Book :

- Introduction to E- Commerce – Martin Katz.
- Gray P.Schneider, 2011, Electronic Commerce , International Student Edition.

Course Outcomes (COs):

- To get basic idea of E-Commerce and its benefits and applications.
- To know about the uses of E-Commerce in banking and how to do online business.
- To learn how to pay online securely and to get knowledge computer crimes.
- To know about the search engine used In E-Commerce and how to advertise in Internet.
- To acquire knowledge of cyber laws regarding E-Commerce.

Question Paper Pattern

Section A - 5 x 15 = 75 (From each Unit 2 Question with Either OR type)

Semester IV – NMEC – II

PART – IV - NON MAJOR ELECTIVE COURSE

2. INTERNET PROGRAMMING

Theory Hours	: 2	Course Code	: U21CS4NME2:2
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 25 75

Objective :

To introduce the basic concepts of Internet and Designing the webpage using HTML.

UNIT I

Internet Connection concepts – What is the Internet - Internet Service – Types of Accounts- Telephone, Cables and Satellite Connections – Choosing an ISP.

UNIT II

Connecting to dialup Internet Accounts - Elements of Window'98 dialup networking – Setting up a Connection with Windows'98 – High Speed Connection : ISDN, ADSL, Cable Modem: Contenders – Choosing a high Speed connection – Connecting via ISDN – Connecting via ADSL..

UNIT III

E-mail Concepts – How do you get your E-mail Addressing – Download E-mail – E-mail netiquette – using Smileys, emotions and Abbreviations – Formatted E-mail – Signature and Stationery – E-mail Attachments – Web-based E-mail – Sending and Receiving Secure E-mail – What is E-mail Security.

UNIT IV

Introduction to HTML - Designing a home page – history of HTML – HTML Generations – HTML documents – anchor tag – hyperlinks – Sample HTML documents – Head and Body Section – Header Section – Title – Prologs – Links – Colorful Webpage – Comment Lines – Some Sample HTML Documents.

UNIT V

Designing the body Section – Heading and Printing – Aligning the heading – Horizontal rule – Paragraph – Tab Setting – Images and Pictures – Embedding PNG Format Images – DHTML and Style Sheets – Defining Style – Elements of Style – Linking a Style sheet HTML Document – Inline Styles – External Style sheet – Internal Style sheet – Multiple Styles – Frames – Frame Definition – Nested Frame Definition.

Text Book :

1. UNIT I, II, III - The Complete Reference Internet Millennium Edition – Margaret Levine Young.
2. UNIT IV, V World Wide Web Design with HTML - C Xavier.

Course Outcomes (COs):

- To get basic idea of Internet.
- To know about the connections of Internet.
- To learn about E-mail.
- To acquire knowledge of HTML.

Question Paper Pattern

Section A - 5 x 15 = 75 (From each Unit 2 Question with Either OR type)

Semester IV – Skill Enhancement Practical – SEC - I

COMPUTER APPLICATIONS IN MS OFFICE LAB

Theory Hours	: -	Course Code	: U214CSSE1
Practical Hours	: 2	Credits	: 2
Exam Hours	:3	Marks	: CIA ESE 40 60

Course Objective :

To learn the basic working concepts of MS Word, Excel and Powerpoint.

MS Word:

- 1) Create a document save it and edit and the document as follows:
 - a) Cut copy and paste options.
 - b) Find and replace options.
 - c) Undo and redo.
- 2) Formate a document as follows.
 - a) Using Bold, Underline and Italic.
 - b) Formatting paragraph center, left and right aligns.
 - c) Changing paragraph and line spacing, using bullets and numbering in paragraphs.
 - d) Creating indent and hanging paragraphs.
- 3) Enhance the document using header footer and page setup, Border, Page number, Water marking, orientation and print preview.
- 4) Insert tables and pictures in document as follows.
 - a) Creating tables in a document with text formatting.
 - b) Selecting rows and columns to sort the record.
 - c) Insert a picture edit size and add name of the picture above it.
- 5) Using mail merge send on invitation for an inagrations function.
- 6) Cover following text to a table using comma as delimiter,
- 7) Type the following as shown.

MS- EXCEL:

8) Open an excel and create fields as follows.

S.no	Name of the student	M	M	M3	M4	To	Avg	Result	Grade

- a) Enter S.no, Name marks for 10 students.
- b) Find total and avg using formula.
- c) Find the result and assign grade.
- 9) Create column chart to show the comparison of different country population for the period of past 5 years.

MS- POWERPOINT

- 10) Create 5 power point slides each slide should support different formate. In these slides explain advantage disadvantage applications of computer.
- 11) Create “My Album” Using photos audio and videos with necessary transition effects.

Course Outcomes (COs):

- To learn the document is saving and document editing.
- To gain the knowledge about document formatting.
- To learn to add headers and footers to a document.
- To learn the basics of page layouts of the documents.
- To gain the knowledge about mail merge and convert text to table features.
- To learn the knowledge of spreadsheets creation, formula insertion and chart creation.
- To create slide presentation with custom animation and album using images, videos and audios.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

OPERATING SYSTEMS

Theory Hours	: 5	Course Code	: U21CSC509
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To have a basic knowledge of processes, Scheduling concepts, Memory Management, Device Management and Information Management.

UNIT I

Evolution of Operating Systems – Types of Operating system – Different views of OS – Design and Implementation of Operating Systems – I/O programming concepts – Interrupt structure & processing.

UNIT II

Memory Management: Single contiguous Allocation – Partitioned Allocation – Relocatable Partitioned Allocation – Paged and Demand paged Memory management – Segmented Memory Management – Segmented and Demand paged memory management – Swapping and overlay techniques.

UNIT III

Processor Management: Job scheduling – process scheduling – functions and policies – Evaluation of Round Robin Multiprogramming performance – Process Synchronization – Race condition – synchronization mechanism – deadly embrace prevention and detect and recover methods.

UNIT IV

Device Management: Techniques for Device management – Device characteristics – I/O Traffic controller, I/O scheduler, I/O device handlers – Virtual devices – Spooling.

UNIT V

File Management: Simple File System – General model of a File system, Physical and Logical File systems. Case studies: DOS, UNIX/LINUX Operating systems.

Text Book:

1. “Operating Systems” – E. Madnick and John J. Donovan, Tata McGraw Hill Book Company Ltd.,

Reference Book:

- “Operating Systems (concepts and design) Milan Milenkovic – McGraw Hill International Edition.
- Operating System Concepts: Abraham Silberschatz, Peter B. Galvin, Greg Gagne.
- Operating Systems: Internals and Design Principles William Stalins.

Course Outcomes(COs):

- To learn the fundamentals of OS.
- To learn the mechanisms of OS to handle processes and threads and their communications.
- To learn the mechanisms involved in memory management in contemporary OS.
- To gain knowledge on distributed OS concepts that includes architecture, mutual exclusion algorithms, deadlock detection algorithms and agreement protocols.
- To know the components and management aspects of concurrency management.
- To learn programmatically to implement simple OS mechanisms.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester – V - Core Paper – X – CC X

**COMPUTER ARCHITECTURE & FUNDAMENTALS OF
MICROPROCESSOR**

Theory Hours	: 5	Course Code	: U21CSC510
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To gain knowledge about the architecture of computer and to understand the concepts of CPU, ALU Design, Input Output Instruction format and different processors.

UNIT I

Digital Logic Circuits – Digital Computers – Logic Gates – Boolean Algebra – Map Simplification Combinational Circuits – Flip Flops – Sequential Circuits – Digital Components – Integrated Circuits – Decoders – Multiplexers - Registers – shift registers – Binary Counters – Memory UNIT

UNIT II

Register transfer and Micro operations - Register Transfer Language - Register Transfer - Bus and Memory Transfer - Arithmetic Micro operations - Logic Micro operations - Shift Micro operations - Arithmetic Logic Shift UNIT.

UNIT III

Central Processing UNIT – Introduction - General Register organization - Stack organization - Instruction formats - Addressing modes - Data Transfer and Manipulation - Program Control - Reduced Instruction Set Computer (RISC) Computer Arithmetic – Introduction – Addition and Subtraction – Multiplication Algorithm – Division Algorithms.

UNIT IV

Microprocessor Architecture – Intel 8085 - Instruction Cycle - Timing Diagram – Intel 8085 Instructions - Programming of microprocessors: Introduction – Assembly language – High level language – Areas of Applications of various languages – MACRO – Microprogramming.

UNIT V

Assembly Language Programming - Simple Examples - Addition and Subtraction of Binary and Decimal Numbers- Complements - Shift – Masking - Microprocessor Applications – 7-Segment LED Display – Measurement of physical Quantities – Temperature measurement & control – Water level indicator - Microprocessor Based Traffic Control.

Text Books :

1. UNIT 1, 2, 3

Computer System Architecture, M. Morris Mano Pearson Education, 3rd Edition, 4th Indian Reprint, 2004.

2. UNIT 4, 5

Fundamentals of Microprocessor and Microcomputers - Badri Ram-5th revised and enlarged edition- Dhanpat Rai Publication-2001.

I UNIT: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7.

II UNIT: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7

III UNIT: 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 10.1, 10.2, 10.3, 10.4

IV UNIT: 3.1, 3.2, 3.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.14

V UNIT: 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18-9.3-9.6-9.6.1, 9.6.4, 9.8.

Course Outcomes (COs):

- To know and understand the guiding principles of digital circuits, their analysis and their design, and their use as components in computers.
- Clear understand of computer Architecture.
- To know and understand the guiding principles of microprocessors, instruction sets and addressing modes.
- To learn the architecture and assembly language programming of 8085 microprocessor.
- To develop a base for advance microprocessors.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – V - Core Paper – XI – CC XI

DATA AND COMPUTER COMMUNICATIONS

Theory Hours	: 5	Course Code	: U21CSC511
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To have a depth knowledge about data communication and networks.

UNIT I :

Data communication-Networks-Protocols and standards –Standards Organizations-Basic concepts- Line configuration –Topology-Transmission mode –Categories of Networks .

UNIT II :

The OSI Model –The Modal –Functions of the Layers –TCP/IP protocol suite. Signals: Analog and digital – Periodic and Aperiodic signals-Analog signals-Time and frequency domains –Composite signals-Digital signals-Encoding and modulating-Analog to digital conversion-Digital to analog conversion-Transmission of digital data: Interfaces & modems- Digital data Transmission-Modems-Cable modem.

UNIT III :

Transmission Media-Guided media-Unguided media-Transmission Impairment – Multiplexing-Many to one/one to many-frequency –division multiplexing(FDM)-Wave division multiplexing(WDM)-Time division multiplexing(TDM) Multiplexing application:-The telephone system-Error detection and correction:- Types of errors-Detection-Vertical redundancy check(VRC)-Longitudinal Redundancy check(LRC)-Cyclic redundancy check(CRC)-Checksum-Error correction.

UNIT IV :

Local Area networks Project 802-Ethernet-Token Bus-Token Ring-Switching-Circuit Switching-Packet Switching Message Switching –Networking and internetworking devices-Repeaters-Bridges-Routers –Gateways-Other devices-Routing algorithms-Distance vector routing –Link state routing.

UNIT V :

TCP/IP Protocol Suite :Part 2,Application layer –client ,Server model-Domain name system-Telnet-File Transfer Protocol:-Trivial File Transfer Protocol(TFTP)-Simple Mail Transfer Protocol(SMTP)-Simple network Management Protocol(SNMP)-Hypertext Transfer Protocol(HTTP)-World Wide Web- VLANs and VPNs-VPN-Network Security-Four aspects of security – Privacy - Digital signature.

Text Book:

1. “ Data communications and Networking ” – 2nd Edition - Behrouz A Forouzan.

Reference Books:

1. Computer Networks - Tanen Baum
2. Computer Networks - William Stallings

UNIT – I : Chapter 1,2 (2.1 to 2.4)

UNIT – II : Chapter 3, 4, 5 (5.2, 5.3), 6 (6.1, 6.4, 6.6)

UNIT – III: Chapter 7 (7.1 to 7.3), 8 (8.1to 8.5), 9 (9.1 to 9.7)

UNIT – IV: Chapter 12 (12.1 to 12.5), 14 (14.1 to 14.3), 21 (21.1 to 21.8)

UNIT – V : Chapter 25 (25.1 to 25.10), 26 (26.2), 27 (27.1 to 27.3).

Course Outcomes (COs):

- Show clear understanding of the basic concepts of data communications including the key aspects of networks and their interrelationship, physical structures, types, models & internetworking.
- Understand the purpose of network layered concepts networks communications using the layered concept, and able to compare and contrast OSI & TCP/IP.
- Show clear & unambiguous understanding of analog transmission of digital and analog data, methods, and the procedures involved in converting digital data and analog to analog signals (modulations -ASK,FSK,PSK,AM,FM,PM).
- Can effectively discuss that bandwidth utilization is goal oriented and involves tradeoffs by showing that multiplexing (TDM, FDM, WDM) efficiently use bandwidth while spread spectrum inefficiently use bandwidth to ensure privacy and ant jamming.
- Illustrations explain the concept of hamming distance, and its relationship to errors as well as detection & correction of errors in blocks codes and implementation of cyclic redundancy check, data logical link control & media access control.
- Understand connectivity LAN's, internetworking principles and how the interrupt protocols IPV4, IPV6 & ICMP operate.
- Understanding routing principles and algorithms such as distance vector & link state & demonstrate the mechanics associated with TCP/IP protocols suite (TFTP, SMTP, SNMP, and HTTP).
- Demonstrate the concept of VLANs, and VPNS and the security aspects with respect to privacy and digital signature.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – V - Core Practical – XII – CC XII

MICROPROCESSOR LAB

Theory Hours	: -	Course Code	: U21CSC512P
Practical Hours	: 6	Credits	: 4
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To gain knowledge about the architecture of computer and to understand the concepts of CPU, ALU Design, I/O Instruction format and different processors.

List Of Practicals

1. 8-bit addition, subtraction, multiplication and division.
2. 16 bit addition.
3. BCD subtraction.
4. Data transfer from one part of the memory to another.
5. Maximum and minimum values.
6. Searching element in the given numbers.
7. Sorting (Ascending and Descending order).
8. Hexadecimal to decimal and decimal to hexadecimal conversion(simple logic only)
9. Reversing an array element.

Course Outcomes (COs):

- To acquire the skill of executing assembly language programs both in microprocessor kit and simulation training kit.
- To know basic operations like addition, subtraction, multiplication and division on 8 & 16 bit datas.
- To know how to move a data from one location to another.
- To write program to find maximum and manimum values.
- To write programs for the conversion of one number system to another.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester – V – MBEC - I - Paper - I

1. COMPUTER GRAPHICS

Theory Hours	: 5	Course Code	: U21CS5MBE1:1
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To impart the basic principles of generating primitives, shapes, package development, interactive graphics, raster graphics, two and three dimensional graphics and their transformations.

UNIT I

Overview of graphics Systems – Video Display Devices – Raster scan systems –Random scan systems – Monitors and Workstations – Input Devices- Hard-Copy Devices - Graphics software. OUTPUT PRIMITIVES – Points and Lines – Line – Drawing Algorithms-Loading the Frame Buffer-Line function- Circle-Generating Algorithms –Ellipse-Generating Algorithms-Filled-Area Primitives-Fill Area Functions- Cell Array-Character Generation.

UNIT II

Attributes of output primitives :Line Attributes – Curve Attributes-Color and Grayscale Levels – Area-Fill Attributes – Character Attributes-Bundled Attributes-Inquiry Functions-Antialiasing. TWO-DIMENSIONAL GEOMETRIC TRANSFORMATIONS –Basic Transformations – Matrix Representations and Homogeneous Coordinates – Composite Transformations – Other Transformations .

UNIT III

Two Dimensional Viewing – The viewing pipeline-Viewing coordinate Reference Frame-Window-to-viewport Coordinate Transformation-Two-Dimensional Viewing Functions-Clipping Operations – Point Clipping-Line Clipping-Polygon Clipping – Curve Clipping-Text Clipping – Exterior Clipping-GRAPHICAL USER INTERFACES AND INTERACTIVE INPUT METHODS – The User Dialogue-Input of Graphical Data-Input Functions-Initial Values for Input-Device Parameters-Interactive Picture-Construction Techniques.

UNIT IV

Three Dimensional concepts – Three- Dimensional Display Methods-Three- Dimensional Graphics Packages-THREE-DIMENSIONAL GEOMETRIC AND MODELING TRANSFORMATIONS –Translation-Rotation-Scaling-Other Transformations –Composite Transformations –Three Dimensional Transformation Functions- Modeling and Coordinate Transformations.

UNIT V

Visible Surface Detection Methods – Classification of Visible-Surface Detection Algorithms – Back Face Detection-Depth-Buffer Method-A-Buffer Method-Scan-Line Method-

Depth-Sorting Method-BSP-Tree Method-Area-Subdivision Method-Octree Methods-Ray-Casting Method-Curved Surfaces-Wireframe Methods-Visibility Detection Functions.

Text Book :

“COMPUTER GRAPHICS”-DONALD HEARN,M.PAULINE BAKER 2nd Edition, PHI Private Limited.

UNIT 1 – Chap 2 (2.1 to 2.7),Chap 3 (3.1 to 3.6,3.11 to 3.14). UNIT II – Chap 4 (4.1 to 4.8), Chap 5 (5.1 to 5.4). UNIT III – Chap 6 (6.1 to 6.11), Chap 8 (8.1 to 8.5).

UNIT IV – Chap 9 (9.1 to 9.2), Chap 11 (11.1 to 11.7) , UNIT V – Chap 13 (13.1 to 13.13).

Reference Book :

“Principles of interactive Computer Graphics” – William M.Newman and Sproull.

Course Outcomes:

- To provide comprehensive introduction about computer graphics system and design algorithms.
- Discuss various two-dimensional geometric transformation and output primitives.
- Extract scene with different clipping methods and its transformation.
- To make the students familiar with concepts of 3D graphics & 3D transformation.
- To get the knowledge of visible surface detection methods.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – V- MBEC I - Paper – II

2. MULTIMEDIA SYSTEMS

Theory Hours	: 5	Course Code	: U21CS5MBE1:2
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To understand and familiar the concepts of Multimedia by creating multimedia applications.

UNIT I

Multimedia Introduction – Multimedia Skills - Multimedia Elements : Text – Sound – Images – Animation - Video.

UNIT II

Multimedia Hardware – Connections – Memory & Storage Device – Input devices – Output hardware – Communication Devices.

UNIT III

Basic Software Tools : Text editing and Word Processing Tools – OCR Software - Painting and Drawing tools – 3 D Modeling and Animation tools – Image editing tools Sound Editing Tools – Animation, Video & Digital Movie Tools. Multimedia Authoring Tools : Card - and – Page – Based Authoring tools – Icon and Object Based Authoring Tools – Time Based Authoring tools. Tools for World Wide Web : Web Servers, Web Browser, Search Engine.

UNIT IV

Planning and Costing : Process of Making Multimedia – Scheduling – Estimating – RFP's AND Bid Proposals.

UNIT V

Designing, Producing and Delivery : Designing - Producing – Delivery – Testing , Preparing for Delivery – Delivery on CD-ROM – Compact Disc Technology – Wrapping – Delivery on WWW.

Text Book :

Tay Vaughnan, “Multimedia: Making it work” 7th Edition, Tata McGraw - Hill 2001

UNIT I – Chapters 2, 3, 4, 5, 6, 7, 8

UNIT II – Chapters 9

UNIT III – Chapters 10, 11, 13

UNIT IV – Chapters 15

UNIT V – Chapters 16, 18.

Course Outcomes (COs) :

- To understand and familiar the concepts of Multimedia by creating multimedia applications.
- Developed understanding of technical aspects of multimedia systems.
- Understand various file formats for audio, video & text media.
- Develop various multimedia systems applicable in real time.
- Design interactive multimedia s/w.
- Apply various networking protocols for multimedia applications.
- To evaluate multimedia application for its performance.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester - V - MBEC I – Paper III

3. DIGITAL IMAGE PROCESSING

Theory Hours	: 5	Course Code	: U21CS5MBE1:3
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To learn the fundamental concepts of Digital Image Processing. To study basic image Processing Operations.

UNIT I

INTRODUCTION AND DIGITAL IMAGE FUNDAMENTALS: Introduction - What is Image Processing- examples of fields that uses DIP Fundamentals step in DIP. Digital image fundamentals – image sensing and acquisition, Image sampling and quantization – Basic relationship between pixels.

UNIT II

IMAGE ENHANCEMENT TECHNIQUES: Some basic intensity transformation functions – Histogram processing Fundamental steps of spatial filtering – smoothing spatial filters.

UNIT III

IMAGE RESTORATION: Model of Image Degradation/restoration process – noise models – restoration in the presence of Noise only Spatial filtering.

UNIT IV

IMAGE COMPRESSION: Fundamentals – Coding redundancy – Spatial and temporal redundancy – Irrelevant information. Some basic compression methods: Huffman coding – arithmetic coding – LZW coding – Run Length coding – Bit-plane coding.

UNIT V

IMAGE SEGMENTATION AND REPRESENTATION: Morphological image processing: preliminaries – Erosion and Dilation. Fundamentals – point, line, and Edge detection: Line Detection – Basic edge detection – More advanced techniques for Edge detection – Edge linking and boundary detection – Thresholding

Text Book:

Digital Image Processing, Third Edition, Rafael C.Gonzalez and Richard E. Woods, Pearson Education, 2008. Chapters: 1.1, 1.3, 1.4, 2.3, 2.4, 2.5, 3.2-3.5, 5.1-5.3, 8.1.1, 8.1.2, 8.2.3-8.2.5, 8.2.7, 9.1, 9.2, 10.1, 10.2.3, 10.2.5-10.2.7, 10.3

Reference Books:

1. Fundamentals of Digital Image Processing, Anil K. Jain, Prentice Hall of India, 1989.
2. Digital Image Processing and Analysis, B. Chandra and D. Dutta Majumder, PHI, New Delhi, 2006.

Course Outcomes (COs) :

- Analyze general terminology of Digital Image Processing
- Examine various types of images, intensity transformations and spatial filtering.
- To learn the techniques of image restoration.
- Understanding the concepts of compression and its algorithms.
- An able to know about the segmentation techniques.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester - V – Skill Enhancement Practical - SEC II

FUNDAMENTALS OF PHOTOSHOP LAB

Theory Hours	: 2	Course Code	: U215CSSE2
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To impart the knowledge about the Photoshop in order to improve the employability skills of the learners.

List of Practicals

1. Handling different file formats.
2. Creating multicolor image using tools.
3. Developing commercial brochures with background Tints.
4. Creating of single image from selected portions of many.
5. Cropping, Rotating, Scalling photo on image.
6. Creation of Photoshop document with multilayer.
7. Text effect on image.
8. Creating pixel arts using tools.
9. Smoothing of sharp edges.

Course Outcomes

- Understand the basic tools and components of a Photoshop.
- Apply basic elements and principles of Photo editing, Cropping, Rotating and Scalling.
- Make use of the shortcut key of the Tools and Panel.
- Learn color selection for both image and text.
- Learn different file formats for saving images.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester - V – Skill Enhancement Course – III - SEC III

JOB INTERVIEW SKILLS

Theory Hours	: 2	Course Code	: U215CSSE3
Practical Hours	: -	Credits	: 2
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

This interview skills training course aim to participants the knowledge and skills required to improve their chances of having that positive interview experience.

UNIT I

Taking Stock of Things: Do your Skills match the job you want- Your job and your personality – SWOT analysis- Job Hunting and Background Search.

UNIT II

Write perfectly to get the Right Job: Getting your basics Rights- Covering letters that sell- Preparing on APT Resume.

UNIT III

How your interaction strategies: Get your Etiquette Right, Before the interview- During the interview- Voice and delivery- Right body language- Dressed.

UNIT IV

Orienting yourself for Group Discussion: Group Discussion- The two sides of Group discussions- The structure of a group discussion- The importance of listening- Analytical skills- Insight and creativity- Flexibility- Assertiveness.

UNIT V

Preparing for the Job Interviews: The interview process- Mindset- Your dress- Entering the interview room- Taking your seat- Answering questions- Asking questions.

Text book:

Group discussion and interview skills, Priyadarshi patnaik.

Course Outcomes:

- Understand the purpose of interviews.
- Be aware of the processes involved different types of interviews.
- Know how to prepare for interview.
- Be clear about the importance of self presentation.
- Identify career opportunities and target specific jobs that match current skills and career goals.

Question Paper Pattern

Section A - 5 x 15 = 75 (From each Unit 2 Question with Either OR type)

Semester VI - Core Paper – XIII – CC - XIII**DATABASE SYSTEM CONCEPTS**

Theory Hours	: 6	Course Code	: U21CSC613
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Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

- To know the fundamentals of Database systems and file systems. To experience the basic SQL functionalities.

UNIT I

Introduction : Database - Database Design : Overview of the design Process – ER Model, Constraints, Removing Redundant Attributes in Entity sets – ER Diagram - Reduction to Relational Schema.

UNIT II

Relational Database – Introduction to Relational Model – Introduction to SQL - Intermediate SQL – Formal Relational Query Language : Relational Algebra.
Database Design : Features of good relational design – Atomic domains & First Normal Forms – Decomposition using functional dependencies – Algorithms for decomposition – decomposition using multi value dependency.

UNIT III

Storage and File Structure : Overview of Physical Storage Media – File Organization – Organization of Records in Files - Data Dictionary Storage – Indexing and Hashing : Basic Concepts – Ordered Indices – B+ Tree Index Files – B- Tree Index Files - Static Hashing – Dynamic Hashing.

UNIT IV

Transaction : Transaction Concept – Simple Transaction model – Storage structure – Transaction Atomicity & durability. Transaction isolation - Serializability - Concurrency Control : Lock Based Protocols – Timestamp Based Protocols – Validation Based Protocols - Recovery System : Failure Classification – Recovery and Atomicity – Recovery Algorithms.

UNIT V

PL/SQL : PL/ SQL Blocks – How PL/SQL Works – Integrating SQL in a PL/SQL Program – Triggers – Stored Procedures and Functions – Packages – Cursors – Transactions.

Text Book:

1. “DATABASE SYSTEM CONCEPTS” –6th Edition - Abraham Silberschatz, Henry F. Korth, S. Sudarshan.
(UNIT I to V). UNIT I – Chapters 1, 7,
UNIT II – Chapters 2, 3, 4, 6, 8
UNIT III – Chapters 10, 11
UNIT IV – Chapters 14, 15, 16
2. UNIT V (Chapters 15 to 20) : Learn Oracle 8i by Jose A. Ramalho, BPB Publications

Reference Book :

1. “An introduction to database system “ – Bipin C desai
2. Oracle 8i A Beginner’s Guide by Michael Abbey, Ian Abramson, Michael Corey.

Course Outcomes (COs)

- Basic concepts of Database management systems.
- Analysis how data are stored and maintained using data models.
- Draw an E-R diagram using entities, attributes and relationships among them.
- Explain the basic database storage structures and access techniques, File organization, indexing methods including B+ tree, B-tree and hashing.
- Its specifies basic issues of transaction processing and concurrency control.
- Show clear understand of PL/SQL blocks, works, triggers, and explain and demonstrate the stored procedures and functions, packages, cursors & transactions.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester VI - Core Paper – XIV – CC - XIV

PHP SCRIPTING LANGUAGE

Theory Hours	: 6	Course Code	: U21CSC614
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To understand server side scripting

UNIT I

Introduction to XHTML : Introduction – Editing XHTML – First XHTML example- W3C XHTML validation service – Headings – Linking c- Images – Special characters and horizontal rules – Lists – Tables – Forms – Internal linking – Meta elements – Web resources.

UNIT II

JavaScript : Introduction to Scripting – JavaScript Control statements – Control structures – if selection statement – if- else selection statement – while repetition statement – Assignment operators – Increment and Decrement operators – for repetition statement – Examples using for statement – Switch multiple - selection statement – do – while repetition statement – break and continue statements – labeled break and continue statements – Logical operators – Functions – Arrays.

UNIT III

Essentials of PHP - Operators and Flow Control - Strings and Arrays.

UNIT IV

Creating Functions - Reading Data in Web Pages - PHP Browser - Handling Power.

UNIT V

File Handling – Working with Databases – Sessions, Cookies, and FTP

Text Books :

1. Internet and World Wide Web- How to program 4th Edition– P.J.Deitel, H.M.Deitel, Pearson Edition.(UNIT I & II)
2. The PHP Complete Reference – Steven Holzner – Tata McGraw-Hill Edition. (UNIT III,IV,V)

Reference Book:

1. Spring into PHP5 – Steven Holzer, Tata McGraw Hill Edition.

Course Outcomes (COs)

- To understand server side scripting
- To get the basic knowledge of XHTML & JavaScript.
- To understand how server-side programming works on the web.

- To learn PHP basic syntax for variable types calculation and creating conditional structures.
- To understanding POST & GET in form submission data.
- To get the knowledge of cookies & session variables.
- To learn the concepts of Read & process data in a MYSQL DB.
- To understand the various file handling functions.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester VI - Core Practical – XV – CC - XV

PROGRAMMING IN PHP LAB

Theory Hours	: -	Course Code	: U21CSC615P
Practical Hours	: 6	Credits	: 4
Exam Hours	: 3	Marks	: CIA ESE 40 60

Course Objective :

To understand server side scripting

List of Practicals:

1. Write a program using controls and functions
2. Develop a program and check message passing mechanism between pages.
3. Design a program using String function and Arrays.
4. Develop a program using parsing functions (use Tokenizing)
5. Write a program and check Regular Expression, HTML functions, Hashing functions.
6. Develop a program and check File System functions, Network functions, Date and time functions.
7. Design a program using session
8. Develop a program using cookie and session.

Course Outcomes:

- Write PHP scripts to handle HTML forms.
- To implement regular expressions, hash functions & HTML function.
- Write a PHP program using parsing function.
- Create a PHP program that includes cookie and session variables.
- Create and manipulate various database tasks using the PHP language.

Question Paper Pattern

All the Programs are considered from the given list.

Internal – 40

External – 60.

Semester VI – MBEC – II - Paper -1

1. SOFTWARE ENGINEERING

Theory Hours	: 6	Course Code	: U21CS6MBE2:1
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To introduce the basic concepts of Software Engineering and the various phases in Software Development.

UNIT I

Introduction – Definitions – Size factors – Quality and productivity factors – Managerial issues - Planning a software project – Introduction – Defining the problem – Developing a solution strategy – Planning the development process – Planning an Organizational structure – Other planning activities.

UNIT II

Software requirements definition – Software requirement specification – Formal specification techniques – Languages and Processors for requirements.

UNIT III

Software design – Fundamental design concepts – Modules and modularization criteria – Design notations – Design techniques – Detailed design considerations – Realtime and distributed system design - Test plans – Milestones, Walkthroughs and Inspections – Design guidelines.

UNIT IV

Verification and validation techniques – Quality assurance – Walkthroughs and Inspections – Static analysis – Symbolic execution – UNIT testing and debugging – System testing – Formal verification.

UNIT V

Software maintenance – Enhancing maintainability during development – Managerial aspects – Configuration management – Source code metrics – Other maintenance tools and techniques.

Text Book:

1. “Software Engineering Concepts” – Richard Fairley.

For UNIT I – Chapters I & II.

For UNIT II – Chapters IV

For UNIT III – Chapter V

For UNIT IV – Chapter VIII

For UNIT V – Chapter IX

Reference Book :

1. Software Engineering a practitioners Approach – Roger S.Pressman

Course Outcomes:

- How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
- An ability to work in one or more significant application domains.
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.
- Demonstrate an understanding of and apply current theories, models and techniques that provide a basis for the software lifecycle.
- Demonstrate an ability to use the techniques and tools necessary for software engineering practice.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Questions with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester VI – MBEC – II - Paper - II

2. SYSTEM ANALYSIS AND DESIGN

Theory Hours	: 6	Course Code	: U21CS6MBE2:2
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To give basic concepts and facilitate the learners in the concepts of System, System Analysis, Design and Implementation.

UNIT I

Conceptual Foundations: Overview of Systems Development – Concepts of Systems.

UNIT II

Concepts of Information and Organizations – Concepts of Data processing.

UNIT III

Techniques and Technologies for Systems Analysis and Design: Problem and Opportunity Recognition – Systems and Information Analysis – Information System Design – Selecting Technology and personnel – Systems Development – Implementation and Evaluation – Project Management for Systems Development.

UNIT IV

Strategic, Administrative, and Higher-level Concepts and Techniques: Systems Administration – Strategic Planning for MIS.

UNIT V

Analysis and Design of Decision Support Systems – End user computing – Future Considerations of Systems Analysis.

Text Book

System Analysis and Design – James C.Wetherbe, Galgotia Publications Pvt Ltd, , Third Edition 1990.

Reference Book

System Analysis and Design – Elias M.Awad

Course Outcomes (COs)

- To give basic concepts and facilitate the learners in the concepts of System, System Analysis, Design and Implementation.
- To understand the concepts of system & its development.
- To identify various types of information system concepts and terminologies.
- Able to recognize the function of system analyst.
- To understand the system analysis & design, implementation and evaluation.
- To learn the system development strategies and future considerations.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

Semester VI – MBEC – II - Paper –III

3. SOFTWARE PROJECT MANAGEMENT

Theory Hours	: 6	Course Code	: U21CS6MBE2:3
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To introduce the basic concepts of Software Project Management and the various phases in Software Management Framework.

UNIT I

Software Management Renaissance: Conventional Software Management – Evolution of Software Economics – Improving Software Economics – The Old Way and the New.

UNIT II

A Software Management Process Framework: Live-Cycle Phases – Artifacts of the Process – Model-Based Software Architectures – Work Flows of the Process – Check Points of the Process.

UNIT III

Software Management Disciplines-I: Iterative Process Planning – Project Organizations and Responsibilities – Process Automation.

UNIT IV

Software Management Disciplines–II: Project Control and Process Instrumentation – Tailoring the Process

UNIT V

Risk Management: Introduction – Risk – Categories of risk – A framework for dealing with risk – Risk Identification – Risk assessment – Risk Planning – Risk Management – Evaluating risks to schedule – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts

Text Books :

1. "Software Project Management" - Walker Royce - Pearson Education
2. "Software Project Management" - Bob Hughes & Mike Cotterell - Fourth Edition - 2008 - ISBN: 978 - 0 - 07 - 061985-2

Course Outcomes (COs)

- To introduce the basic concepts of Software Project Management and the various phases in Software Management Framework.
- To learn about the evaluation of software economics and the ways to improve it.
- To understand both theoretical and methodological issues involve in software project management.
- To understand the Life Cycle phases of a Software management and learn about the model based software architectures.
- To learn about organizational, factors & project manager responsibilities.
- To develop strategies to calculate risk factors involved in projects.

Question Paper Pattern

Section A - $20 \times 1 = 20$ (Objective type questions (MCQ - 20))

Section B - $5 \times 5 = 25$ (From each Unit 2 Question with Either OR type)

Section C - $3 \times 10 = 30$ (Each Unit one question)

INTERNET OF THINGS

Theory Hours	: 5	Course Code	: U21CS6MBE3:1
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective:

To know the communication technologies in IoT, IoT protocols and web of things.

UNIT - I

Introduction: Defining Internet of Things – IoT : A Web 3.0 View – Ubiquitous IoT Applications : Important Vertical IoT Applications - Telematics and Intelligent Transport Systems – Smart Grid and Electric Vehicles – Smarter Planet and Smart Buildings – Four Pillars of IoT : The Horizontal, Verticals, and Four Pillars – M2M: The Internet of Devices – RFID : The Internet of Objects – WSN : The Internet of Transducers – SCADA : The Internet of Controllers.

UNIT- II

The DNA of IoT : DCM : Device, Connect, and Manage – Device : Things that Talk – Connect : Via Pervasive Networks : Wired Networks - Wireless Networks- Satellite IoT. Protocol Standardization for IoT : Web of Things versus Internet of Things – Two Pillars of the Web – IoT Protocol Standardization Efforts : M2M and WSN Protocols – SCADA and RFID Protocols – Issues with IoT Standardization.

UNIT - III

The Cloud of Things : The Internet of Things and Cloud Computing – Mobile Cloud Computing- MAI versus XaaS : The Long Tail and the Big Switch – The Cloud of Things Architecture: Four Deployment Models – Vertical Applications – Fifteen Essential Features – Four Technological Pillars – Three Layers of IoT Systems – Foundational Technological Enablers.

UNIT - IV

The BACnet™ Protocol : United States – Europe – Internetworking – Technology :Physical Layer - Link Layer – Network Layer – Transport and Session Layer – Presentation and Application Layers – BACnet Security – BACnet Over Web Services – The LonWorks® Control Networking Platform : Standardization – Technology – Web Services Interface for LonWorks Networks :Echelon SmartServer – A REST Interface for LonWorks .

UNIT - V

KNX : The Konnex / KNX Association – Standardization – KNX Technology Overview – Physical Layer – Data Link and Routing Layers, Addressing – Transport Layer – Application Layer – KNX Devices, Functional Blocks and Interworking – Device Configuration – ZigBee : Development of the Standard – ZigBee Architecture – Association – The ZigBee Network Layer – The ZigBee APS Layer – ZigBee Security.

Text Books :

1. The Internet of Things in the Cloud: A Middleware Perspective-Honbo Zhou–CRC Press 2012

Unit I - 1.3,1.4, 2.2, 3.1, 3.2, 3.3, 3.4 & 3.5.

Unit II - 4.1, 4.2, 4.3, 6.1 & 6.2. Unit III – 9.1, 9.2, 9.3 & 9.4.

2. Olivier Hersent, David Boswarthick, Omar Elloumi , “The Internet of Things – Key Applications and Protocols.

Unit IV – 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3 & 4.4.

Unit V – 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.3, 7.4, 7.5 & 7.7.

Reference Books:

1. Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010.
2. The Internet of Things: Applications to the Smart Grid and Building Automation by - Olivier Hersent, Omar Elloumi and David Boswarthick - Wiley -2012

Course Outcomes:

- To Understand the different architectures for IoT.
- To learn various protocols at the different layers for IoT.
- To Understand the different business models for IoT.
- To develop a middle ware for IoT.
- To develop Applications of IoT in Industrial Contacts.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester VI – MBEC – III - Paper - II

CYBER SECURITY

Theory Hours	: 5	Course Code	: U21CS6MBE3:2
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To give the concepts of Cyber security basics and provides safe internet.

UNIT I:

Cyber security basics-Steps to Improve Computer Security-Stay safe from spyware threats with a specialized security solution-Keeping Windows operating system and vulnerable applications up to date-Use a standard user account in Windows operating system to go online-UAC- Going online with a secure browser-About trust public and free Wi-fi networks-log out- posting private information on your social media accounts-accessing Questionable web locations.

UNIT II:

Internet Security Myths-Internet Security Myths That You Need To Forget-Master basic security terms: Essential cyber security terms-Antispyware Software-Antivirus Software-Cyber-Attack-Drive-bydownload-Exploit-Keylogging-Malvertising-Malware-Patching-Phishing-Ransomware-Social engineering-Spam-Trojan-URL or web content filtering-Virus-Vulnerability-Zero-Day virus.

UNIT III:

Mastering password security: The 7 Deadly Sins of Password Management- creating a good password in easy steps-safely store your passwords-Next-generation anti-hacking tools-Steps to Bulletproof Your Digital Security.

UNIT IV:

Guidelines for safe internet browsing-safe browsing-tips for buying online-clearing cache for browsers: Clearing cache for Chrome Browsers above version 10-9.3.2 Clearing cache for Chrome Browsers from version 1 to 9-Clearing cache for Safari for iOS, iPhone and iPad-Clearing cache for Safari for Mac OS x-Clearing cache for Safari for windows.

UNIT V:

Wireless security: what is Wireless LAN?- major issues with WLAN-Email and social media security : Safe browsing guidelines for social networking sites.

REFERENCES :

1. **E-Book** - https://heimdalsecurity.com/pdf/cyber_security_for_beginners_ebook.pdf (Unit I, II, III)
2. <http://www.uou.ac.in/sites/default/files/slm/FCS.pdf> (Unit IV, UNIT V).

Course Outcomes:

- Ability to know about cyber security basics
- Develop knowledge about internet security myths.
- Gain through understanding about password security.
- Familiarize with safe internet browsing.
- Provide clear expose about wireless security.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

SOCIAL COMPUTING

Theory Hours	: 5	Course Code	: U21CS6MBE3:3
Practical Hours	: -	Credits	: 5
Exam Hours	: 3	Marks	: CIA ESE 25 75

Course Objective :

To understand the important features of social computing and learn to analyze the data left behind in social media.

UNIT I

Mining Twitter : twitter in all the rage – Exploring Twitter’s API, Analyzing the 140 characters. **Mining Facebook** : Exploring Facebook’s social Graph API – Analyzing social graph connections. **Mining web pages**: Scraping, Parsing and crawling the web.

UNIT II

Analyzing the social web: Nodes, Edges and Network Measures, Basics of network structure, Representing networks, Basic Network Structures and properties- Network Structure and Measures. Describing nodes and edges, Describing networks. Entity Resolution and Link Prediction.

UNIT III

Community Maintained Resources, Supporting technologies for community maintained resources, User motivations- Location based social interaction, location technology, mobile location sharing- Social information Sharing and social filtering, Automated recommender system- Social media in the public sector, Analysing public sector social media.

UNIT IV

Random walks in social networks and their applications a survey: Random walks on Graphs- Background- **Related work**: Algorithms, Applications, Evaluation and datasets. **A survey link prediction in social networks**: Feature based link prediction, Bayesian probabilistic models. **Privacy in social networks**: Privacy breaches in social networks.

UNIT V

Visualizing social networks: A Taxonomy of visualizations- The convergence of Visualization, Integrating sensors and social networks- Multimedia information networks.

Text books :

- 1) Matthew A. Russell, :Mining the Social Web; Data mining Facebook, Twitter, LinkedIn, Google+, Github, and More,” 2nd Edition, O’Reilly media, 2013.
- 2) JenniferGolbeck, “ Analyzing the social web, “Morgan kaufmann, 2013.
- 3) Charu.Aggarwal(ed.), “Social Network Data Analytics, “Springer, 2011.

Reference books :

- 1) Tina Yesayan, “Social Networking: A Guide to Strengthening Civil Society Through Social Media(SMGuide4CSO),” U.S Agency for international Development, 2014.
- 2) Subhasish Dasgupta, “Social Computing: Concepts, Methodologies, Tools, and Applications,: Information Science Reference, Hershey, New York, 2010.
- 3) Todd Kelsey, :Sociall Networking Spaces: From Facebook to Twitter and Everything in Between, ”A press the experts voice, 2010.
- 4) Parongama Sen, Bikas K. Chakrabarti, “Sociophysics: AnIntroduction, “Oxford University press, 2014.
- 5) Davina Rungen, “Web 2.0 and Social Computing,” Lambert Academic Publishing, 2011.

Course Outcomes (COs)

- To develop knowledge about mining the social networks like Twitter, Facebook.
- To get analyzing skills about network structures and their properties.
- To gain the knowledge about community maintained resources, Supporting technologies and Social information Sharing and social filtering
- To know about random walks, link prediction and privacy in social networks.
- To learn the knowledge about the Taxonomy of visualizations in social networks.

Question Paper Pattern

Section A - 20 x 1 = 20 (Objective type questions (MCQ - 20))

Section B - 5 x 5 = 25 (From each Unit 2 Question with Either OR type)

Section C - 3 x 10 = 30 (Each Unit one question)

Semester – VI - AEC

ABILITY ENHANCEMENT – GENDER STUDIES

Theory Hours	: 1	Course Code	: U216GS
Practical Hours	: -	Credits	: 1
Exam Hours	: 3	Marks	: CIA ESE 25 75

myF – 1

ghypdk; njhlu;ghd Nfhl;ghLfs; : ghypay;-ghypdk; - clw;\$WuPjpahf epu;zapj;jy; -Mzhjpf;fk; - ngz;zpak; - ghypd ghFghL – ghypd Ntiyg;ghFghL – ghypd xUg bj;jhditfs; - ghypd czu;t+l;ly; - ghypd rktha;g;G – ghypd rkj;jtk; - ghypd ika ePNuhl;lkhf;fy; - mjpfhug;gLj;jy;.

myF- 2

kfspupay; Vs ghypd rkj;jtf;fy;tp – gy;fiyf;fHf khdpaf;FOtpd; topf;fhl;Ljy;fs; - VohtJ Ie;jhz;Lj;jpl;lk; Kjy; gjpNdhuhtJ Ie;jhz;Lj;jpl;lk; - ghypd rkj;jtf;fy;tp : nga;lpq; khehL kw;Wk; ngz;fSf;F vjpuhd midj;J td;KiwfisAk; xopg;gjw;fhd ru;tNjr cld;gbf;if - ,iz;jy;/ cl;gLjds;jy; - xJf;fy;

myF – 3

ghypay; ghFghl;bw;fhd jsq;fs; : FLk;gk; - ghypd tpfpjr;rhuk; - fy;tp – Mnuhf;fpak; - MSik – kjk; - Ntiy Vs Ntiytha;g;G – re;ij – Clf;fs; - murpay; - rl;lk; - FLk;g td;Kiw - ghypay; Jd;GWj;jy; - muR nfhs;iffs; kw;Wk; jpl;lq;fs; .

myF- 4

ngz;fs; Nkk;ghL kw;Wk; ghypd rkj;jt Nkk;ghL : Kaw;rpfs; - ru;tNjr ngz;fSf;fhd jrhg;jk; - ru;tNjr ngz;fs; Mz;L – ngz;fspd; Nkk;ghl;bw;fhd Njrpa nfhs;if – ngz;fs; mjpfhu Mz;L 2001 – ru;tNjr nfhs;iffis ika ePNuhl;lkhf;fy;

myF – 5

ngz;fs; ,af;fq;fs; kw;Wk; ghJfhg;G epWtd Vw;ghLfs; : Njrpa kw;Wk; khepy kfspu; Mizak; - mizj;J kfspu; fhly; epiyaf;fs; - FLk;g ePjp kd;wq;fs; - FLk;g td;KiwapypUe;J ngz;fisg; ghJfhf;Fk; rl;lk; 2005- gzpaplq;fspy; ngz;fs; kPjhd ghypay; Jd;GWj;jy;fis jLg;gjw;fhd cr;rePjpkd;w topf;fhl;Ljy;fs; - jha;Nra; kw;Wk; jtw hf gad;gLj;jjiy jil nra;jpLk; rl;lk; - <t;Brpq; (ngz;fis njhy;iy nra;jy;) jLg;Gr; rl;lk; - Ra cjt pf;FOf;fs; - gQ;rhaj;J mikg;GfSf;fhd 73 – tj kw;Wk; 74 –tj rl;l;jjpUj;jk;.

Question Paper Pattern

Section A - 5 x 15 = 75 (From each Unit 2 Questions with Either OR type)