KALAIGNAR KARUNANIDHI GOVERNMENT ARTS COLLEGE FOR WOMEN (AUTONOMOUS)

(Affiliated to Bharathidasan University, Thiruchirappalli & Re-Accredited with B^{++} by NAAC)

PUDUKKOTTAI – 622 001

B.Sc COMPUTER SCIENCE

(Choice Based Credit System)

SYLLABUS

(From 2021 – 2022 onwards)

Members of Board of Studies

Chairman :

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Kalaignar Karunanidhi Govt. Arts College for Women (Autonomous),
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University Nominee

Dr. Karamath Ali M.Sc., M.Phil., Ph.D
Associate Professor of Computer Science,
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Subject Experts

1. Dr. G. Sujatha M.C.A., M.Phil., Ph.D.
   Associate Professor of Computer Science,
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Industrialist

Mr. N.BALAJI B.E
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INK REFUGE SOLUTIONS,
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Alumni

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B.Sc. COMPUTER SCIENCE

PROGRAMME OUTCOMES

Upon completion of B.Sc. Degree programme, the graduates will be able to

PO1: Acquire fundamental knowledge of Mathematics, Physical, Chemical, Life Sciences and Computing to identify, formulate and develop solutions to scientific problems.

PO2: Relate scientific ideas with practical experience in various fields and develop skills to implement new scientific techniques.

PO3: Apply analytical, creative and problem solving skills to plan, execute and report the results of theoretical and experimental investigations.

PO4: Explore technical knowledge to pursue higher education and excel as entrepreneurs.

PO5: Integrate professional, ethical and social issues and interpret the benefits, limitations of Science and its application in technological developments

PROGRAMME SPECIFIC OUTCOMES

Upon completion of B.Sc. Computer Science Programme, the graduates will be able to

PSO1: Identify fundamental principles of Computer Science and create awareness on the current issues and latest trends.

PSO2: Design and utilize computer programs / software tools to solve complex computing problems.

PSO3: Apply problem-solving skills and the knowledge of Computer Science to Cope up with technological developments.

PSO4: Explore technical knowledge in diverse areas of Computer Science and cultivate skills for successful career, entrepreneurship and higher studies.

PSO5: Develop real-time applications, design projects, generate reports and make effectual presentations.

KALAIGNAR KARUNANIDHI GOVT. ARTS COLLEGE FOR WOMEN (AUTONOMOUS)
PUDUKKOTTAI

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. COMPUTER SCIENCE COURSE PATTERN (2022- 2025)

Sem	S.No.	Code	Title of the Paper	Hrs	Credits	SE + CIA	Total
I	1	21UT1	Language Course - I	6	3	75 + 25	100
	2	21UE1	English Language Course - I	6	3	75 + 25	100
	3	21UCS01	Core Course I – Theory	6	5	75 + 25	100
	4	21UCS02P	Core Course II - Practical	4	4	75 + 25	100
	5	21UAMCS1	First Allied Course - I	6	3	75 + 25	100
	6	21UVB	AEC - Value Education	2	2	75 + 25	100
		TOTAL		**30**	**20**		**600**
II	7	21UT2	Language Course - II	6	3	75 + 25	100
	8	21UE2	English Language Course - II	6	3	75 + 25	100
	9	21UCS03	Core Course III - Theory	5	5	75 + 25	100
	10	21UCS04P	Core Course IV - Practical	4	4	75 + 25	100
	11	21UAMCS2	First Allied Course - II	5	3	75 + 25	100
	12	21UAMCS3	First Allied Course - III	4	3	75 + 25	100
		TOTAL		**30**	**21**		**600**
III	13	21UT3	Language Course - III	6	3	75 + 25	100
	14	21UE3	English Language Course - III	6	3	75 + 25	100
	15	21UCS05	Core Course V- Theory	6	5	75 + 25	100
	16	21UCS06P	Core Course VI - Practical	5	5	75 + 25	100
	17	21UAPCS1	Second Allied Course - I	5	3	75 + 25	100
	18	21UES	AEC- Environmental Studies	2	2	75 + 25	100
		TOTAL		**30**	**21**		**600**
	*	**21UCSSS1**	Self Study Course - I	**-**	**2**	100	**100**

Sem	S.No	Code	Title of the Paper	Hrs	Credits	SE + CIA	Total
IV	19	21UT4	Language Course - IV	6	3	75 + 25	100
	20	21UE4	English Language Course - IV	6	3	75 + 25	100
	21	21UCS07	Core Course VII - Theory	4	4	75 + 25	100
	22	21UCS08P	Core Course VIII - Practical	3	3	75 + 25	100
	23	21UAPCS2	Second Allied Course -II	5	3	75 + 25	100
	24	21UAPCS3P	Second Allied Course – III Practical	4	3	75 + 25	100
	25	21UCSSB1	SEC- Skill Enhancement Course - I	2	2	75 + 25	100
		TOTAL		**30**	**21**		**700**
	*	**21UCSSS2**	Self Study Course - II	**-**	**2**	100	**100**
V	26	21UCS09	Core Course IX - Theory	5	5	75 + 25	100
	27	21UCS10	Core Course X - Theory	5	5	75 + 25	100
	28	21UCS11	Core Course XI - Theory	4	4	75 + 25	100
	29	21UCS12P	Core Course XII - Practical	5	4	75 + 25	100
	30	21UCSME1	Major Elective - I	4	4	75 + 25	100
	31	21UCSSB2	SEC- Skill Enhancement Course - II	2	2	75 + 25	100
	32	21USB3	SEC- Skill Enhancement Course - III	2	2	75 + 25	100
	33	21U*NME1	Non Major Elective I	2	2	75 + 25	100
	34	21USB1	Yoga and Health	1	1	75 + 25	100
		TOTAL		**30**	**30**		**900**
VI	35	21UCS13	Core Course XIII - Theory	5	5	75 + 25	100
	36	21UCS14	Core Course XIV - Theory	6	5	75 + 25	100
	37	21UCS15P	Core Course XV - Practical	6	5	75 + 25	100
	38	21UCSME2	Major Elective - II	5	4	75 + 25	100
	39	21UCSME3	Major Elective - III	5	4	75 + 25	100
	40	21U*NME2	Non Major Elective II	2	2	75 + 25	100
	41	21UGS	Gender Studies	1	1	75 + 25	100
	42	21UEXA	Extension Activity	-	1	-	-
		TOTAL		**30**	**27**		**700**

	I	II	III	IV	V	VI	TOTAL
Hrs / Week	30	30	30	30	30	30	180
Credits	20	21	21	21	30	27	140
No. of Courses	6	6	6	7	9	7	46
Marks	600	600	600	700	900	700	4100

Exam hours for each Course : 3

Maximum Marks Per Course

	External	CIA
Theory	75	25
Practical	75	25

Minimum Pass

CIA	External	Aggregate
40%	40%	40%

Total Marks : 3900

S.No	PART	Course	No. of Courses	Inst. Hrs	Credits	Total Marks	Total Marks
1	I	Language Course	4	24	12	400	**400**
2	II	English Language Course	4	24	12	400	**400**
3	III	Core Course	15	73	68	1500	**2400**
		Allied Course	6	29	18	600	
		Major Elective Course	3	14	12	300	
4	IV	Non Major Elective Course	2	4	4	200	**800**
		Skill Enhancement Course	3	6	6	300	
		Ability Enhancement Courses					
		Value Education	1	2	2	100	
		Environmental Studies	1	2	2	100	
		Yoga	1	1	2	100	
5	V	Gender Studies	1	1	1	100	**100**
		Extension Activities	-	-	1	-	-
TOTAL			**41**	**180**	**140**		**4100**

QUESTION PAPER PATTERN FOR B.Sc. COMPUTER SCIENCE

THEORY (For all papers)

Part	Type	Qn. No.	Unit	Marks for each Question	Total Marks
A	Answer all the Questions	1 & 2	I	2	20
		3 & 4	II		
		5 & 6	III		
		7 & 8	IV		
		9 & 10	V		
B	Internal Choice - Answer all the Questions	11a / 11b	I	5	25
		12a / 12b	II		
		13a / 13b	III		
		14a / 14b	IV		
		15a / 15b	V		
C	Answer any three Questions	16	I	10	30
		17	II		
		18	III		
		19	IV		
		20	V		
External Marks					**75**
CIA					**25**
Max. Marks					**100**

CONTINUOUS INTERNAL ASSESSMENT PATTERN FOR UG

THEORY

Exam	Max. Marks	Converted to
Mid Semester	40	5
End Semester	40	5
Model Exam	75	10
Assignment	5	5
Total Marks		**25**

PRACTICAL

Internal :

Model Exam	: 15Marks
Regular Practical classes (Observation)	: 5 Marks
Viva	: 5 Marks
Total	**: 25 Marks**

External :

Practical Exam	: 60 Marks
Record	: 10 Marks
Viva	: 5 Marks
Total	**: 75 Marks**

Passing Minimum for UG :

CIA	External	Aggregate
40%	40%	40%

List of Core Courses

Theory :

1. C Programming
2. C++ Programming
3. Python Programming
4. Data Structures
5. Java Programming
6. Database Management System
7. Computer Networks
8. Digital Design and Microprocessor
9. Operating System

Practicals :

1. C Programming Practical
2. C++ Programming Practical
3. Python Programming Practical
4. Data Structures Practical
5. Java Programming and SQL Practical
6. Web Designing and Microprocessor Practical

List of Core Electives :

1. Computer Graphics
2. PHP Programming
3. Software Engineering
4. Unix and Shell Programming
5. Open Source Technologies

List of Non Major Electives :

1. Principles of Information Technology
2. HTML

List of Skill Enhancement Courses :

1. Office Automation
2. Structured Query Language

List of Self Study Courses :

1. Web Designing
2. Visual Basic Programming
3. Introduction to Photoshop

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. COMPUTER SCIENCE COURSE PATTERN (2022 - 2025)

Sem	S.No	Part	Code	Title of the Paper	Hrs	Credits	CIA	SE	Marks
I	1	I	21UT1	Tamil	6	3	25	75	100
	2	II	21UE1	English	6	3	25	75	100
	3	III	21UCS01	C Programming	6	5	25	75	100
	4	III	21UCS02P	C Programming Practical	4	4	25	75	100
	5	III	21UAMCS1	Allied Mathematics –I	6	3	25	75	100
	6	IV	21UVB	Value Education	2	2	25	75	100
TOTAL					**30**	**20**			**600**
II	7	I	21UT2	Tamil	6	3	25	75	100
	8	II	21UE2	English	6	3	25	75	100
	9	III	21UCS03	C++ Programming	5	5	25	75	100
	10	III	21UCS04P	C++ Programming Practical	4	4	25	75	100
	11	III	21UAMCS2	Allied Mathematics -II	5	3	25	75	100
	12	III	21UAMCS3	Allied Mathematics -III	4	3	25	75	100
TOTAL					**30**	**21**			**600**
III	13	I	21UT3	Tamil	6	3	25	75	100
	14	II	21UE3	English	6	3	25	75	100
	15	III	21UCS05	Python Programming	6	5	25	75	100
	16	III	21UCS06P	Python Programming Practical	5	5	25	75	100
	17	III	21UAPCS1	Applied Physics – I	5	3	25	75	100
	18	IV	21UES	Environmental Studies	2	2	25	75	100
	21UCSSS1			Web Designing	-	**2**	-	100	**100**
	TOTAL				**30**	**23**			**600**
IV	19	I	21UT4	Tamil	6	3	25	75	100
	20	II	21UE4	English	6	3	25	75	100
	21	III	21UCS07	Data Structures	4	4	25	75	100
	22	III	21UCS08P	Data Structures Practical	3	3	25	75	100
	23	III	21UAPCS2	Applied Physics - II	5	3	25	75	100
	24	III	21UAPCS3P	Applied Physics – III Practical	4	3	40	60	100
	25	IV	21UCSSEC1	SEC I - Office Automation	2	2	25	75	100
	21UCSSS2			Visual Basic Programming	-	**2**	-	100	**100**
TOTAL					**30**	**23**			**700**

V	26	III	21UCS09	Java Programming	5	5	25	75	100
	27	III	21UCS10	Computer Networks	5	5	25	75	100
	28	III	21UCS11	Data Base Management System	4	4	25	75	100
	29	III	21UCS12P	Java Programming and SQL Practical	5	5	25	75	100
	30	III	21UCSME1	Core Elective - I	4	4	25	75	100
	31	IV	21UCSSEC2	SEC II – Structured Query Language	2	2	25	75	100
	32	IV	21USB3	SEC III – Soft Skill for Professionals	2	2	25	75	100
	33	IV	21U*NME1	Non Major Elective I	2	2	25	75	100
	34	IV	21USB1	Yoga and Health	1	1	25	75	100
TOTAL					**30**	**30**			**900**
VI	35	III	21UCS13	Digital Design and Microprocessor	5	5	25	75	100
	36	III	21UCS14	Operating System	6	5	25	75	100
	37	III	21UCS15P	Web Designing and Microprocessor Practical	6	5	25	75	100
	38	III	21UCSME2	Core Elective - II	5	4	25	75	100
	39	III	21UCSME3	Core Elective - III	5	4	25	75	100
	40	IV	21U*NME2	Non Major Elective II	2	2	25	75	100
	41	V	21UGS	Gender Studies	1	1	25	75	100
	42	V	21UEXA	Extension Activity	-	1			
			TOTAL		**30**	**27**			**700**
Total credits and Marks : 140 Credits/4100 Marks									
Total credits and Marks for Part 3 : 99 Credits/2400 Marks									

Non Major Electives Offered by the department

1. 21UCSNME1 Principles of Information Technology
2. 21UCSNME2 HTML

Total Marks for Each Part

P1 – 400 Marks
P2 – 400 Marks
P3 – 2400 Marks
P4 – 800 Marks
P5 – 100 Marks

CORE COURSE I

C PROGRAMMING (21UCS01)

Hours / week : 6

Credits : 5

COURSE OBJECTIVES :

- To Define the basic concepts of C language.
- To Develop structured programs using C language
- To Analyze the concept of arrays and functions and apply them in real time application
- To Apply the concepts of Structures and Unions
- To Remember the concepts of files and create files in C language

UNIT I

Overview of C : History of C – Importance of C – Basic Structure of a C program

Constants, Variables and Data Types : Character Set – C Tokens – Keywords and Identifiers – Constants – Variables - Data types – Declaration of variables – Assigning Values to Variables – Defining Symbolic Constants.

Operators and Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment & Decrement operators – Conditional operator – Bitwise operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic operators - Type conversion in Expressions.

UNIT II

Managing Input and Output Operations : Reading a Character – Writing a character – Formatted Input – Formatted Output.

Decision Making and Branching : Decision making with If statement – Simple If – The IF Else Statement – Nesting of IF Else Statements – The Else IF Ladder – The Switch Statement – The ? : operator – Go to statement.

Decision Making and Looping : Introduction – The While Statement – The Do Statement – The For Statement .

Arrays : Introduction – One dimensional Arrays – Declaration of One dimensional Arrays – Initialization of One dimensional arrays – Two dimensional arrays - Initialization of Two dimensional arrays.

UNIT III

Character Arrays and Strings : Declaration and Initializing String Variables - Reading Strings from Terminal – Writing Strings to Screen – Arithmetic operations on Characters – Putting Strings together - Comparison of Two strings – String Handling Functions.

User Defined Functions : Need for User defined functions - Elements of User defined functions – Definition of functions – Return Values and their types - Function calls – Function declaration – Nesting of functions – Recursion – Passing Arrays to function – The Scope, Visibility and Lifetime of Variables.

UNIT IV

Structures and Unions : Defining a structure – Declaring Structure Variables – Accessing Structure Members – Structure Initializations – Arrays of structures – Unions – Size of Structures.

Pointers : Understanding Pointers – Accessing the Address of a variable – Declaring Pointer Variables – Initialization of Pointer Variables – Accessing a variable through its Pointer – Pointers and Arrays - Pointers as Function Arguments – Pointers to functions.

UNIT V

File Management in C : Defining and Opening a File - Closing a File - Input and Output Operations on Files .

The Preprocessor : Introduction – Macro Substitution – File Inclusion.

Text Book :

1. "Programming in C" – E. Balagurusamy – Tata McGraw-Hill Publications- Seventh Edition 2017.

Reference Books :

1. "Programming with C" – Byron S Gottfried – Schaum's Outline Series – Tata McGraw- Hill Publications - Fourth Edition, 2018
2. "The Spirit of C" – Henry Mullish & Herbert L. Cooper – Jaico Publishing House.
3. "C Programming" - Pushpendra Singh , Sambhav singhal – Walnut Publication, 2019.
4. "Let us C" – Yashavant kanetkar –BPB Publications – 16th Edition.
5. "Mastering C" - K R Venugopal , Sudeep R Prasad, Second Edition, McGraw Hill Publications - 2015.

Web References :

1. https://www.tutorialspoint.com/cprogramming
2. https://www.programiz.com/c-programming

COURSE OUTCOMES :

Upon completion of the course "C Programming", the students will be able to

#	Course Outcome
CO1	Apply the basic concepts of C in Real time applications
CO2	Demonstrate the concept of technical constructs like control Statements
CO3	Compare Arrays and String Handling Functions.
CO4	Analyze the concepts of Structures, Unions and Pointers
CO5	Explore the concept of files and its applications.

Relationship Matrix for COs, POs and PSOs

Semester	Code		Title of the Course			Hours			Credits	
I	21UCS01		C Programming			6			5	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓		✓	✓	✓	✓		✓
CO2	✓	✓		✓		✓	✓	✓	✓	
CO3	✓	✓	✓	✓			✓	✓	✓	✓
CO4		✓	✓				✓	✓	✓	
CO5	✓	✓			✓	✓	✓		✓	✓
Number of Matches = 34 Relationship: High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE II P

C PROGRAMMING PRACTICAL (21UCS02P)

Hours / week : 4

Credits : 4

COURSE OBJECTIVES :

- To Remember the syntax of Control Structures
- To Recall the syntax of Decision making statements
- To Create Programs using arrays and String functions
- To Develop programs using Functions and Structures
- To Write Programs using files

List of Programs :

1. Largest of three given numbers
2. Solution of a Quadratic Equation (all cases)
3. Sum of first N natural numbers (using While loop, do while loop, for loop)
4. Sum of digits of given number, Reverse the given number
5. Displaying the given pattern using loops
6. Check whether the given number is Armstrong or not
7. Check whether the given number is Prime or not
8. Finding Largest number in an array
9. Displaying Multiplication Table
10. Find count of odd and even numbers in the given array.
11. Find whether the given number is present in the array or not
12. Ascending Order
13. Matrix Addition
14. Matrix Multiplication
15. Checking Palindrome
16. Finding String Length, String Copy, String Compare (use Switch case)
17. Alphabetical order
18. Fibonacci numbers using Function

19. Factorial using Recursion

20. Inventory Processing using Structures

21. Mark list processing using files

Web References:

1. https://www.tutorialgateway.org/c-programming-examples
2. https://www.programmingsimplified.com/c-program-examples

COURSE OUTCOMES :

Upon completion of the course "C Programming lab", the students will be able to

#	Course Outcome
CO1	Recall the syntax of control structures
CO2	Create Programs using Decision making statements and loops
CO3	Develop Programs using arrays and String functions.
CO4	Write Programs using Structures
CO5	Gain Skills to manipulate files

CORE COURSE III

C++ PROGRAMMING (21UCS03)

Hours/Week : 5

Credits : 5

COURSE OBJECTIVES :

- To Apply the basic concepts of OOPS in C++ Programming .
- To Identify the concept of classes and objects.
- To Perform manipulation using Constructors and Overloading.
- To Analyze the various types of Inheritance and Polymorphism.
- To Comprehend the concept of File management and Exception Handling

UNIT I

Principles of Object Oriented Programming : Basic Concepts of Object Oriented Programming - Benefits, of OOP – Applications of OOP.

Basic concepts of C++ : Tokens, Keywords, Identifiers and Constants - Basic data types, User Defined data types , Derived data types – Storage Classes- Symbolic Constants - Variables, Operators, Manipulators – Expressions - Control Structures.

UNIT II

Functions: The Main function – Function Prototyping – Call by Reference – Inline Function – Default Arguments – Const Arguments - Function overloading – Friend and Virtual functions.

Classes and Objects : Specifying a Class - Defining Member Function - Nesting of Member Function - Private Member Function - Arrays within a Class - Arrays of Objects - Objects as Function Arguments – Friendly functions - Returning Objects - Const Member Functions.

UNIT III

Constructors and Destructors : Constructors - Parameterized Constructors – Multiple Constructors in a Class - Constructors with Default Arguments - Dynamic Initialization of Objects - Copy Constructor - Dynamic Constructors - Destructors.

Operator Overloading and Type conversions: Defining Operator Overloading - Overloading Unary Operators - Overloading Binary Operators - Overloading Binary Operators Using Friends -Manipulation of Strings Using Operators – Rules for Overloading operators - Type Conversions

UNIT IV

Inheritance : Introduction - Single Inheritance – Multiple Inheritance – Multilevel Inheritance – Hierarchical Inheritance - Hybrid Inheritance.

Pointers, Virtual Functions and Polymorphism : Introduction - Pointers to Objects – This Pointer – Polymorphism – Virtual Functions – Pure Virtual Function .

UNIT V

Files : Classes for File Stream Operations – Opening and Closing a files - Detection End of File – File pointers and their Manipulations – Error handling during file operations - Command Line Arguments.

Templates: Introduction – Class Templates – Class Templates with Multiple Parameters – Function Templates – Function Templates with Multiple Parameters – Member Function Templates .

Exception Handling: Introduction – Basics of Exception Handling – Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism – Rethrowing an Exceptions.

Text Book :

1. "Object Oriented Programming With C++" - E.Balagurusamy - Tata McGrawHill Publishers Ltd., New Delhi, Seventh Edition , 2017.

Reference Books:

1. "Object Oriented Programming in C++" – Robert Lafore - 4th Edition – Pearson Education, 2008.
2. "C++ - The Complete Reference – Herbert Schildt, 4th Edition - Tata McGraw Hill, 2003
3. "The C++ Programming Language" - Bjarne Stroustrup,- 4th edition - Addison Wesley Pearson Education - 2013
4. "Let us C++", Yashavant Kanetkar - Second edition, BPB Publications, 2012
5. "C++ Primer" – Stanley B. Uppman, Josee lajoie, Barbara E. Moo – 5th edition – Pearson Education, 2007

Web References :

1. https://www.learncpp.com
2. https://www.w3schools.com/cpp

COURSE OUTCOMES

Upon completion of the course "Object Oriented Programming using C++ " , the students will be able to

#	Course Outcome
CO1	Describe the basic concepts of OOP.
CO2	Create programs using classes and objects
CO3	Develop Programs using Constructors and Overloading
CO4	Apply the concept of Inheritance and Polymorphism
CO5	Implement files in C++

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
II	21UCS03	C++ PROGRAMMING	5	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓		✓	✓	
CO2	✓	✓	✓	✓	✓	✓		✓		
CO3	✓	✓	✓		✓	✓	✓	✓		
CO4	✓		✓		✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO6										
Number of Matches = 38 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE IV P

C++ PROGRAMMING PRACTICAL(21UCS04P)

Hours/Week : 4

Credits : 4

COURSE OBJECTIVES :

- To Develop programs using Class and Objects
- To Analyze different types of arrays and apply the concepts of OOP.
- To Write Programs using constructor and overloading.
- To Distinguish various types of Inheritance.
- To Remember the file concept using File Streams

List of Programs :

1. Looping Constructs and Switch statements
2. Classes and Objects
3. Array of Objects
4. All types of Constructors
5. Single Dimensional Arrays
6. Multi Dimensional Arrays
7. String manipulation using Pointers
8. Inline function, Friend function and Virtual Function
9. Function Overloading (Passing Objects, Arrays as Function Arguments)
10. Operator Overloading
11. Type Conversion
12. All types of Inheritance and Method overriding
13. Manipulators
14. File I/O Stream operations
15. Exceptions

Web references :

1. https://hackr.io/tutorials/learn-c-plus-plus
2. https://www.programiz.com/cpp-programming/examples

COURSE OUTCOMES:

Upon completion of the course " C++ Programming lab", the students will be able to

#	Course Outcome
CO1	Identify the Syntax and Semantics of the C++ programming language.
CO2	Build programs using classes and objects
CO3	Design Programs with Constructors and Overloading
CO4	Classify the types of Inheritance
CO5	Develop code to implement the concept of files in C++

CORE COURSE V

PYTHON PROGRAMMING(21UCS05)

Hours/Week : 6

Credits : 5

COURSE OBJECTIVES :

- To discover the basic features of Python.
- To develop Python programs with conditional statements and loops.
- To analyze Python data structures - lists, tuples and dictionaries
- To do input/output with files in Python.
- To implement Object Oriented Programming in Python

UNIT I

Python : Origin – Features – Downloading and Installing Python –Running Python.

Getting Started: Print Statement- Program Input and the raw input() - Built-in Function – Comments- Operators-Variables and Assignment.

Python Basics: Statements and Syntax – Variable Assignment – Identifiers – Basic Style Guidelines – Memory Management – First Python Programs.

UNIT II

Python Objects: Python Objects – Standard Types – Other Built-in Types – Internal Types –Standard Type Operators – Standard Type Built – in Functions.

Numbers: Introduction to Numbers – Integers – Double Precision Floating Point Numbers Complex Numbers – Operators.

Sequences: Strings, Lists and Tuples : Sequences- Strings-Strings and Operators – String Only Operators- Built-in Functions- String Built-in Methods - Lists- Operators-Built-in Functions- List Type Built-in Methods - Tuples – Tuple Operators and Built-in Functions

UNIT III

Mapping and Set Types: Mapping Type Dictionaries – Mapping Type Operators –Mapping Type Built-in and Factory Functions-Mapping Type Built-in Methods - Set Types – Set Type Operators- Built-in Functions- Set Type Built-in Methods.

Conditionals and Loops: if Statement – else Statement – elif (aka else-if) Statement- Conditional Expressions(aka "The Ternary Operator")- While Statement- for Statement-break Statement- Continue Statement- pass Statement- else Statement - Iterators and the iter() Function.

UNIT IV

Files and Input/Output: File Object-File Built - in Functions [open() and file()] - File Built-in Methods- File Built-in Attributes- Standard Files- Command –Line Arguments-File System-File Execution.

Functions and Functional Programming : Functions – Calling Functions – Creating Functions – Passing Functions – Formal Arguments – Variable Length Arguments – Function Programming – Variable Scope – Recursion.

UNIT V

Object Oriented Programming : Introduction – Object oriented Programming – Classes – Class Attributes – Instances – Instance Attributes – Binding and Method Invocation – Static Methods and Class Methods – Composition – Subclassing and Derivation – Inheritance.

Text Book :

1. "Core Python Programming"– Wesley J. Chun – Prentice Hall India – Third Edition.

Reference Books:

1 . "Think Python: How to Think Like a Computer Scientist" - Allen B. Downey - 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.

2. "Exploring Python" - Timothy A. Budd,- Mc-Graw Hill Education (India) Private Ltd, 2015.

3. "Introduction to Computation and Programming Using Python" - John V Guttag- Revised and expanded Edition, MIT Press , 2013.

Web references :

1. https://www.programiz.com/python-programming
2. https://www.python.org/about/gettingstarted

COURSE OUTCOMES:

Upon completion of the course "Python Programming", the students will be able to

#	Course Outcome
CO1	Identify the basic concepts of Python and its overview
CO2	Develop application using Lists and Tuples
CO3	Classify set operations
CO4	Explain File handling and command line arguments.
CO5	Implement OOPS concepts in Python

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
III	21UCS05	**PYTHON PROGRAMMING**	6	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2			✓	✓	✓	✓		✓	✓	✓
CO3	✓		✓	✓	✓		✓	✓	✓	✓
CO4	✓		✓		✓	✓	✓		✓	✓
CO5	✓		✓	✓	✓		✓	✓		✓
CO6										
Number of Matches = 37 Relationship: High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE VI P

PYTHON PROGRAMMING PRACTICAL (21UCS06P)

Hours/Week : 5

Credits : 5

COURSE OBJECTIVES :

- To Create simple Python Programs using basic concepts
- To Design programs using String
- To Illustrate the use of lists and tuples
- To Manage files in Python
- To Analyze Object Oriented Concepts

List of Programs :

1. Simple programs
2. String Operators
3. String Methods
4. Lists
5. Tuples
6. File Handling
7. Command Line arguments
8. Functions
9. Classes and methods
10. Inheritance
11. OOPS concepts

Web References:

1. https://www.programiz.com/python-programming/examples
2. https://www.tutorialgateway.org/python-programming-examples

COURSE OUTCOMES:

Upon completion of the course "Python Programming Lab ", the students will be able to

#	Course Outcome
CO1	Write Simple programs using Strings
CO2	Describe the List, Tuples and Dictionaries in Python
CO3	Implement File operations in Python
CO4	Design Programs using command line arguments.
CO5	Implement OOPS concepts in Python

CORE COURSE VII

DATA STRUCTURES (21UCS07)

Hours/Week : 4

Credits : 4

COURSE OBJECTIVES :

1. To identify the linear data structures lists, stacks, and queues and their practical application.
2. To implement linked lists in real time.
3. To explain the nonlinear data structures such as Trees and Graphs
4. To comprehend various algorithm design strategies
5. To compare different sorting techniques.

UNIT I

Arrays: Axiomatization - Ordered Lists.

Stacks: Basic Stack Operations - Representation of a Stack - Evaluation of Expressions - Conversion of Infix to postfix expression.

Queues: Basic Queue Operations - Representation of a Queue - Circular Queue.

UNIT II

Linked Lists : Introduction - Singly Linked Lists - Representation of a linked list – Linked Stacks and Queues - Circular Linked List - Doubly Linked Lists - Polynomial Addition

UNIT III

Trees : Basic Terminology – Binary Trees - Binary Tree Representations – Binary Tree Traversal - Threaded Binary Trees- Application of trees- Set representation – Decision Trees

UNIT IV

Graphs : Definitions and Terminologies - Representations of Graphs: Adjacency list, Adjacency multi list and Adjacency matrix – Graph traversals : Depth First Search – Breadth First Search - Connected Components and Spanning Trees - Shortest Paths and Transitive Closure.

UNIT V

Searching: Linear Search – Binary Search **Sorting** : Insertion sort –Selection sort - Quick Sort – Merge Sort. **Hashing**: Hashing Functions.

Text Book :

1. "Fundamentals of Data Structures" –Ellis Horowitz and Sartaj Sahni – Galgotia Book Source 2013

Reference Books :

1. "Data Structures" – LIPSCHUTA, Tata McGraw Hill, Schaum's OutlineSeries
2. "Data Structure Using C" - A. Tannenbaum, Pearson Education, 2003.
3. "Classic Data Structures", D.Samanta, 2005.
4. "Data Structures, Algorithms and Applications in C" - SartajSahni, Tara McGraw Hill Publications, 2000
5. "Data Structures" - A.A.Puntambekar - Technical Publications Pune, 2009

Web references:

1. https://www.javatpoint.com/data-structure-tutorial
2. https://www.edureka.co/blog/c-data-structures

COURSE OUTCOMES:

Upon completion of the course "Data Structures", the students will be able to

#	Course Outcome
CO1	Identify the strength and weakness of different data structures.
CO2	Explain stacks and queues and their practical application.
CO3	Create Network to find the Shortest paths
CO4	Apply the tree structure in solving real life Problems
CO5	Compare the searching and sorting techniques and apply them properly

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course				Hours			Credits	
IV	21UCS07	Data Structures				4			4	
Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓		✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓		✓			✓
CO3	✓		✓				✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓	✓		
CO5	✓	✓	✓	✓	✓		✓		✓	✓
Number of Matches = 36 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE VIII P

DATA STRUCTURES PRACTICAL (21UCS08P)

Hours / week : 3

Credits : 3

COURSE OBJECTIVES :

- To perform manipulations on Stack and queue data structure
- To identify and apply the suitable data structure for the given real world problem.
- To implement different sorting techniques
- To illustrate the use of different controls in VB
- To develop code using File controls

List of Programs:

Data Structures:

1. Write a C program to implement push and pop operations on Stack.
2. Write a C program to implement insert and delete operations on Queue.
3. Write a C program that uses functions to perform the following:
   a) Create a singly linked list of integers
   b) Insert a given integer in to the linked list.
   c) Delete a given integer from the above linked list.
   d) Display the contents of the above list after deletion.
4. Write a C program that uses stack operations to convert a given infix expression into its postfix Equivalent.
5. Write a C program to find an element using Binary Search.
6. Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order:
   a) Insertion sort b) Merge sort
7. Write C programs for implementing the following graph traversal algorithms:
   a)Depth first traversal b)Breadth first traversal.

Web references:

1. https://www.programmingsimplified.com/c/data-structures
2. https://www.geeksforgeeks.org/data-structures

COURSE OUTCOMES:

Upon completion of the course “Data Structures Practical ”, the students will be able to

#	Course Outcome
CO1	Create Programs using linear data structure such as Queue and Stack
CO2	Compare the sorting algorithms
CO3	Identity the appropriate data structure for given problem.
CO4	Develop programs with check box and list box
CO5	Write Programs with file controls

CORE COURSE IX

JAVA PROGRAMMING (21UCS09)

Hours / Week : 5

Credits : 5

COURSE OBJECTIVES :

- To analyze the Java program structure and OOPs concepts
- To apply the concepts of classes, objects, method overloading and inheritance.
- To illustrate the concepts of packages, interfaces and exception.
- To differentiate the types of thread and exception handling.
- To acquire the concept of applet programming

UNIT I

Overview of Java Language : Introduction – Java Program Structure – Java tokens – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.

Classes , Objects and Methods : Introduction – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance: Extending a Class – Overriding Methods – Final Variables and Methods – Final Classes - Finalizer Methods – Abstract Methods and Classes – Method with Var args – Visibility Control.

UNIT II

Arrays, Strings And Vectors : Introduction – One-dimensional Arrays – Creating an Array – Two-dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types – Annotations.

Interfaces : Multiple Inheritance : Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

UNIT III

Packages : Putting Classes together : Introduction – 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 : Introduction – 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 a ‘Runnable ‘ Interface – Inter-thread Communication.

UNIT IV

Managing Errors and Exceptions : Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.

Graphics Programming : Introduction – The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets- Drawing Bar Charts – Introduction to AWT Package – Introduction to Swings.

UNIT V

Applet Programming : Introduction – 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- Get Input from User – Event Handling.

Text Books :

1. "Programming with Java" – E.Balagurusamy, Tata McGraw Hill –2000 4th Edition

   Chapters (1-3,8-16) for Unit–1, Unit–2, Unit–3, Unit-5.

1. "Java 2 – The Complete Reference" – Herbert Schildt - Tata McGraw Hill, New Delhi 2002.

   For Unit – 4 (Graphics Programming)

Reference Books :

1. "JAVA Hand Book" – Patrick Naughton - Tata McGraw Hill - New Delhi 1996.
2. "Object Oriented Programming through JAVA"- P. Radha Krishna, , Universities Press, 2007
3. "Java Programming", K.Rajkumar, Pearson India, 2013

Web references:

1. **https://www.javatpoint.com/java-tutorial**
2. **https://www.guru99.com/java-tutorial.html**

COURSE OUTCOMES:

Upon completion of the course "Java Programming ", the students will be able to

#	Course Outcome
CO1	Acquire fundamental knowledge in Java Programming.
CO2	Gain the ability to develop basic programming skills and design reusable code in Java.
CO3	Apply the creation of packages and Threads to real life problems
CO4	Comprehend the functionality of inheritance and polymorphism in Java.
CO5	Demonstrate the use of applets for web based applications.

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
V	21UCS09	Java Programming	5	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓		✓	
CO3	✓	✓	✓	✓		✓	✓	✓		✓
CO4	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓		✓
Number of Matches = 40 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE X

COMPUTER NETWORKS (21UCS10)

Hours/Week : 5

Credits : 5

COURSE OBJECTIVES :

- To Understand the basic concepts of Data Communication Networks.
- To Know about the types of Transmission Media
- To Analyze the Congestion Control algorithms.
- To Understand the Networking and Internetworking Devices.
- To gain knowledge about various Services of Session Layer, Presentation Layer and Application Layer.

UNIT I

Introduction : Data communication – Networks – Protocols and Standards.

Basic Concepts : Line Configuration – Topology – Transmission Mode – Categories of Networks – Internetworks.

OSI Model : The Model - Layered Architecture – Functions of the Layers- TCP/IP Protocol Suite.

UNIT II

Transmission Media : Guided Media – Unguided Media – Transmission Impairment – Performance.

Data Link Control : Line Discipline – Flow Control – Error Control.

UNIT III

Switching: Circuit Switching – Packet Switching – Message Switching.

Frame Relay : Congestion Control – Leaky Bucket Algorithm.

UNIT IV

Networking & Inter Networking Devices : Repeaters – Bridges – Routers – Gateways – Routing Algorithm – Distance Vector Routing – Link State Routing.

UNIT V

Upper OSI Layers : Session Layer – Presentation Layer – Application Layer.

Text Book :

"Data communications and Networking" –Behrouz A Forouzan – Tata McGraw Hill 2nd Edition Update , Reprint 2012

Reference Book :

"Computer Networks" - Andrew S.Tanenbaum - Prentice Hall Of India, New Delhi, July 1988 – 3rd Edition.

COURSE OUTCOMES:

Upon completion of the course "Computer Networks", the students will be able to

#	Course Outcome
CO1	Distinguish between OSI model & TCP/IP protocol suite
CO2	Describe about the types of Transmission Media
CO3	Explain the types of Switching
CO4	Describe the relationship among the networking devices
CO5	Identify the functionality of Higher level layers

Relationship Matrix for COs, POs and PSOs

Semester	Code		Title of the Course			Hours			Credits	
V	21UCS10		Computer Networks			5			5	
Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓	✓	
CO2		✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3		✓	✓	✓	✓	✓	✓	✓	✓	
CO4		✓	✓		✓	✓	✓		✓	✓
CO5				✓			✓	✓	✓	
Number of Matches =36 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE XI

DATABASE MANAGEMENT SYSTEM (21UCS11)

Hours / Week : 4

Credits : 4

COURSE OBJECTIVES:

- To define the basic concepts and architecture of database management system
- To classify the Operations in Relational Algebra and Calculus
- To perform manipulations on relational databases using SQL commands.
- To gain knowledge on database normalization.
- To identify various recovery Procedures and solve concurrency Problems

UNIT I

An Overview of Database Management: Introduction – Definition of database - Definition of Database System – Data Models –Possible Representations for data – Data Independence – DDL – DML - Benefits of database approach

Database System Architecture : The Three Levels of Architecture – Database Administrator – Client / Server Architecture – Distributed Processing.

UNIT II

An Introduction to Relational Databases : Introduction – Relational Model – Relations and Relvars – Optimization – base relvars and views - Transactions.

Domains, Relations and Base Relvars : Introduction – Domains- Relation values Relation variables.

Relational Algebra : Introduction – Syntax & Semantics of Relational Algebra operators – Additional Operators.

Relational Calculus : Introduction – Tuple Calculus – Domain Calculus

UNIT III

An Introduction to SQL : Introduction –Views – Transactions- Embedded SQL.

Table Creation and Manipulation in SQL : Table – Components – Create Table – Viewing data in Table – Select – Where – Distinct – Order by – Creating a Table from a Table –Inserting data into a Table from another Table – Delete - Update – Modify Structure – Computation on Table Data – Arithmetic Operators – Logical Operator – Between – Like – In – Dual - Aggregate Functions.

UNIT IV

Functional Dependencies : Introduction – Basic Definition.

Normalization : First , Second, Third, Fourth, and Fifth Normal Forms – BOYCE / CODD Normal Form.

UNIT V

Recovery: Introduction – Transactions – Transaction Recovery – System Recovery – Media Recovery.

Concurrency : Three concurrency Problem - Locking – Deadlock – Serializability.

Text Book :

1. "An Introduction to Database System" – C.J.Date – Addison Wesley Publications – Eighth Edition 2004. (For Unit 1, 2, 4,5)

2. SQL, PL/SQL The Programming Language of SQL – Ivan Bayross – Fifth Edition – BPB Publications 2010, New Delhi. (For Unit 3)

Reference Books :

1." Database System Concepts", Abraham Silberschatz , Henry F. Korth, S. Sudarshan, McGraw-Hill-Seventh edition, 2019.

2. S K Singh, "Database Systems Concepts, Design and Applications", Pearson Education, 2019.

3. "Databases Illuminated", Catherine M. Ricardo, Susan D. Urban, Jones & Bartlett Learning, Third edition, 2015.

Web References:

1. https://www.javatpoint.com/dbms-tutorial
2. http://www.tutorialspoint.com/sql/sql_tutorial.pdf

COURSE OUTCOMES:

Upon completion of the course "DataBase Management System", the students will be able to

#	Course Outcome
CO1	Explain the basic concepts of data models and architecture of Database Management System.
CO2	Perform various operations on Relational Algebra.
CO3	Write basic SQL queries to perform database operations.
CO4	Analyze normalization ideas and explain various normal forms.
CO5	Identify concurrent database access problems and solve them using locking.

Relationship Matrix for COs, POs and PSOs

Semester	Code		Title of the Course			Hours		Credits		
V	21UCS11		Database Management System			4		4		
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓			✓	✓			
CO2	✓	✓	✓	✓	✓		✓	✓	✓	
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓
CO4	✓	✓	✓			✓		✓	✓	✓
CO5	✓	✓	✓		✓		✓	✓		✓
Number of Matches = 36 Relationship: High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE XII P

JAVA PROGRAMMING AND SQL PRACTICAL(21UCS12P)

Hours / Week : 5

Credits : 5

COURSE OBJECTIVES :

- To Create programs using Vector manipulation
- To Apply the concepts of Packages and Interfaces
- To Design simple Applet Programs
- To Create table and apply built-in functions in SQL.
- To illustrate the use of set operations and cursors in SQL.
- To write SQL queries using functions and procedures.

List of Programs

Java Programming:

1. Classes and Objects
2. Arrays
3. String manipulation
4. Vector manipulation
5. Inheritance
6. Interfaces
7. Packages
8. Polymorphism using Method Overloading
9. Constructor Overloading
10. Method Overriding
11. Multithreading
12. Exception Handling
13. Simple programs using Applets.
14. Graphics programs for drawing lines, rectangles, ovals and Polygons

SQL :

1. Table creation & manipulation
2. Usage of built-in functions
3. Simple queries and nested queries
4. Set Operations and join queries.
5. Simple PL/SQL program using cursors
6. Simple PL/SQL program using functions & procedures
7. Develop a database for the Student Information systems with the following concepts.
    a. Creation & Retrieval
    b. Retrieval using Cursors
    c. Updation using Triggers
8. Payroll Processing
9. Electricity bill preparation
10. Inventory processing

Web references:

1. **https://www.programiz.com/java-programming/examples**
2. **https://www.javatpoint.com/java-programs**

COURSE OUTCOMES:

Upon completion of the course "Java Programming and SQL Lab", the students will be able to

#	Course Outcome
CO1	Construct Programs using Polymorphism
CO2	Acquire skills and knowledge in Graphics program in java.
CO3	Design interactive user interface using Applets.
CO4	Write SQL queries using SET operators, built-in and aggregate functions
CO5	Design PL/SQL programs for Electricity bill preparation and Inventory processing

CORE COURSE XIII

DIGITAL DESIGN AND MICROPROCESSOR (21UCS13)

Hours/Week : 5

Credits : 5

COURSE OBJECTIVES:

- To define the basic concepts of Boolean algebra
- To simplify the Boolean circuits
- To build simple Sequential circuits
- To demonstrate the architecture of microprocessor
- To classify the assembly language instructions

UNIT I :

Boolean Algebra and Logic Gates : Basic definitions – Axiomatic definition of Boolean algebra – Basic theorems and properties of Boolean algebra - Boolean functions – Canonical and standard forms – Digital logic gates.

UNIT II :

Simplification of Boolean functions : The map method – Two and Three Variable maps - 4 variable maps – Product of sums simplification – Don't care conditions.

Combinational Logic : Introduction – Adders - Subtractors

UNIT III :

MSI and PLD Components : Introduction - Decoders – Encoders – Multiplexers.

Synchronous Sequential Logic : Flipflops – Triggering of flipflops – Analysis of clocked Sequential circuits

Registers, Counters And The Memory Unit : Registers – Shift Registers – Ripple Counters.

UNIT IV :

Introduction : Word Length of a Microprocessor - Evolution of Microprocessors- Single-chip Microcomputers- CPU - Buses – Memory Addressing Capacity of CPU – Processing Speed of a Processor

MicroProcessor Architecture : Introduction - Intel 8085 architecture – pin configuration – Instruction Cycle – Timing Diagram.

UNIT V

Instruction Set of Intel 8085 : Instruction Classification– Addressing Modes.

Intel 8085 Instructions: Data Transfer Group, Arithmetic Group, Logical Group, Branch Group, Stack, I/O and Machine Control Group

Assembly Language Programming: Addition of two 8 bit numbers, Subtraction of 8 bit Numbers – 8 bit Multiplication product 16 bit– 8 bit division - Find the largest number in an array – Find the smallest number in an array –Multi byte Addition - Multi byte Subtraction.

Text Books :

1. "Digital Design " – MorisMano M – Prentice Hall of India, 2nd Edition – 1996
   (For Units 1 to 3)
2. "Fundamentals of Microprocessors and Microcontrollers" – Badri Ram – Eighth revised edition 2014-Dhanpat Rai Publications Ltd. (For Units 4 and 5)

Reference Book :

1. "Digital Computer Fundamentals" – Thomas Bartee – McGraw Hill – 6th edition
2. "Digital Principles and Applications", Albert Malvino, Donald. P.Leach , 2002, Tata McGraw- Hill Publishing Company Limited, New Delhi
3. "Computer System Architecture", M. Morris Mano, Pearson Publications, Third Edition
4. "Microprocessor Architecture, Programming and Application with the 8085/8080A "– Ramesh S.Goankar – Penram International Publishers, India 2003.

Web References:

1. https://www.javatpoint.com/examples-of-boolean-algebra-simplification-using-logic-gates
2. https://www.tutorialspoint.com/microprocessor/microprocessor_8085_instruction_sets.htm

COURSE OUTCOMES:

Upon completion of the course "Digital Design and Microprocessor", the students will be able to

#	Course Outcome
CO1	Recall the Boolean algebra theorems
CO2	Build simple logic circuits using gates
CO3	Analyze the working principle of various flip flops
CO4	Define the concepts and architecture of Microprocessor
CO5	Summarize the assembly language instructions

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course				Hours			Credits	
VI	21UCS13	Digital Design And Microprocessor				5			5	
Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓		✓		✓	✓	✓	✓		
CO2	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓	✓	✓		
CO4	✓		✓	✓		✓	✓	✓		✓
CO5	✓	✓	✓		✓		✓	✓	✓	✓
Number of Matches = 37 Relationship: High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE XIV

OPERATING SYSTEM (21UCS14)

Hours/Week : 6

Credits : 5

COURSE OBJECTIVES:

- To Explain the need of operating system, its components and evolution.
- To Outline the process synchronization and deadlock concepts.
- To Summarize memory management concept and to Compare various management techniques.
- To illustrate the concept of processor and disk scheduling.
- To Analyze file systems, their architecture and management.

UNIT I

Operating System Overview : Operating System Objectives and Functions – The Evolution of Operating System.

Process Description and Control : Process – Process States – A Five State Model – Process Description – Process Control.

Threads : Processes and Threads.

UNIT II

Concurrency : Mutual Exclusion and Synchronization : Principles of Concurrency – Mutual Exclusion – Hardware Approach – Semaphores – Monitors.

Concurrency : Deadlock and Starvation : Principles of Deadlock – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection.

UNIT III

Memory Management : Memory Management Requirements – Memory Partitioning – Paging – Segmentation.

Virtual Memory : Hardware and Control structures – Paging(Virtual) – Segmentation (Virtual) - Page Replacement Policies.

UNIT IV

Uniprocessor Scheduling : Types of Processor Scheduling – Scheduling Algorithms.

I/O Management & Disk Scheduling : Organization of I/O Function – Disk Scheduling.

UNIT V

File Management : File and File Systems – File Structure – File Management System – File System Architecture – File Organization and Access – File Directories – File Sharing.

Text Book :

"Operating Systems" – William Stallings – Prentice Hall of India – 7th Edition, 2012

Reference Books :

1. "Operating Systems" , Deitel Harvay M., Pearson Education Publications, Singapore, 2003
2. "Operating Systems", GodboleAchyut S., Tata McGraw Hill Publishing Company Limited, New Delhi, 2002
3. "Operating System-Concepts and Design", Milan Milankovic, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005.
4. "Operating Systems – Design and Implementation", Tanenbaum Andrew S. & Woodhull Albert S., Pearson Education Publications, Singapore, 2002.

Web References :

1. https://www.tutorialspoint.com/operating_system/os_overview.htm
2. https://www.guru99.com/operating-system-tutorial.html

COURSE OUTCOMES:

Upon completion of the course "Operating System", the students will be able to

#	Course Outcome
CO1	Recall the components and evolution of operating systems
CO2	Relate synchronization techniques, deadlock prevention, avoidance and detection.
CO3	Analyze different memory management techniques and page replacement methods.
CO4	Compare various processor and disk scheduling algorithms
CO5	Explain the concepts of file system organization.

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course				Hours			Credits	
VI	21UCS14	Operating System				6			5	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓		✓	
CO2		✓	✓	✓	✓	✓		✓	✓	
CO3		✓	✓	✓			✓	✓	✓	
CO4		✓	✓	✓	✓		✓	✓	✓	✓
CO5		✓		✓	✓		✓		✓	✓
CO6										
Number of Matches =34 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

CORE COURSE XV P

WEB DESIGNING AND MICROPROCESSOR PRACTICAL (21UCS15P)

Hours / Week : 6

Credits : 5

COURSE OBJECTIVES:

- To Develop programs using decision making and branching statements
- To Write PHP code using arrays and functions
- To illustrate the use of Session and Cookies
- To Create and manipulate MYSQL databases from PHP
- To Determine the use of Assembly language Instructions

List of Programs:

PHP:

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements.
3. Write a program to find the maximum value in a given multi dimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Write a program to upload a file to the server.
7. Write a program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page.
8. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
9. Design an authentication web page in PHP with MySQL to check username and password.
10. Write a PHP program to access the data stored in a MYSQL table.
11. Write a PHP program interface to create a database and to insert a table into it and do manipulations.

Microprocessor:

1. 8 bit Addition (using Direct , Immediate and Indirect Addressing).
2. 8 bit Subtraction (using Direct , Immediate and Indirect Addressing).
3. Addition of two 8 bit numbers with carry
4. Subtraction of two 8 bit numbers with borrow
5. Multiplication of two 8 bit numbers with carry.
6. Division of two 8 bit numbers.
7. Multi Byte Addition.
8. Multi Byte Subtraction.
9. Sum of n 8 bit numbers.
10. Maximum value in an array.
11. Minimum value in an array.
12. Data Transfer from one part of memory to another.
13. Ascending order/ Descending Order

Web References:

1. https://www.freecodecamp.org/news/the-best-php-examples/
2. http://www.ptutorial.com/php-example/

COURSE OUTCOMES:

Upon completion of the course "PHP Programming and Microprocessor lab ", the students will be able to

#	Course Outcome
CO1	Demonstrate the use of Conditional statements
CO2	Compare the usage of different array functions
CO3	Design simple webpages
CO4	Apply PHP code to manipulate SQL database
CO5	Develop programs using Assembly language

ELECTIVE COURSE I

COMPUTER GRAPHICS (21UCSME1)

Hours/Week : 4

Credit : 4

COURSE OBJECTIVES:

- To define the basic concept of graphical techniques and display systems.
- To analyze the line and circle generation algorithms
- To apply the 2D transformation and attributes to real time application.
- To discuss the 2D Viewing and two dimensional Clipping operations
- To classify the 3D transformation and 3D geometric modeling transformation

UNIT I

A Survey of Computer Graphics : Computer aided design – Presentation Graphics – Education and Training – Graphical User Interfaces.

Overview of Graphics Systems : Refresh Cathode Ray Tubes– Raster Scan Displays – Random Scan Displays – Color CRT Monitors – Direct View Storage Tubes – Flat Panel Displays - Hard copy Devices – Graphics software.

UNIT II

Output Primitives : Points and Lines - Line Drawing Algorithms (DDA, Bresenham's) – Mid Point Circle Algorithm – Filled Area Primitives – Fill Area Functions - Character Generation.

UNIT III

Attributes of Output Primitives : Line Attributes – Curve Attributes - Color and Grayscale levels – Area fill attributes – Character Attributes – Bundled attributes - Antialiasing.

Two Dimensional Transformations : Basic and Composite Transformations – Matrix representations – Other Transformations (Reflection – Shear.).

UNIT IV

Two Dimensional Viewing : The Viewing Pipeline –Window-to-View Port Transformation – Two Dimensional Viewing Functions – Clipping Operations – Point Clipping – Cohen Sutherland Line Clipping – Sutherland Hodgeman Polygon Clipping.

UNIT V

GUI and Interactive Input Methods : Logical Classification of Input Devices – Interactive Picture Construction Techniques – Virtual Reality Environments.

Three Dimensional Concepts : Three Dimensional Display Methods .

Three Dimensional Geometric and Modeling Transformations : Translation – Coordinate Axes Rotations – Scaling – Reflections - Shears.

Text Book :

1. "Computer Graphics" – Donald Hearn and M.Pauline Baker – Pearson – 2012.

Reference Book :

1. "Principles of Interactive Computer Graphics" – William M.Neuman and Robert F Sproul - McGraw Hill International Edition.

Web References:

1. https://www.tutorialspoint.com/computer_graphics/
2. https://lecturenotes.in/subject/59/computer-graphics-cg

COURSE OUTCOMES:

Upon completion of the course "Computer Graphics", the students will be able to

#	Course Outcome
CO1	Identify the basic computer graphical techniques and display system
CO2	Implement Line and Circle generation algorithm in Real world application
CO3	Compare the basic and composite 2D transformation
CO4	Remember the 2D viewing and Clipping Operations
CO5	Evaluate 3D Geometrical modeling transformation

Relationship Matrix for COs, POs and PSOs

Semester	Code		Title of the Course			Hours			Credits	
V	21UCSME1		Computer Graphics			4			4	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓	✓		✓
CO2	✓	✓	✓	✓				✓	✓	✓
CO3	✓	✓		✓		✓	✓	✓	✓	✓
CO4	✓		✓	✓		✓	✓	✓		✓
CO5	✓	✓		✓		✓		✓		✓
CO6										
Number of Matches = 34 Relationship: High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

ELECTIVE COURSE II

PHP PROGRAMMING (21UCSME2)

Hours/Week : 5

Credits : 4

COURSE OBJECTIVES:

- To define the basic operators and flow control statements in PHP
- To learn how to handle web pages
- To implement file handling functions in PHP
- To develop cookies and sessions
- To illustrate Ajax concepts

Unit I

Essentials of PHP : Creating a first PHP page – Running PHP page – Mixing HTML and PHP – Printing some text – Printing some HTML – more Echo Power – Using PHP here documents – Command Line PHP – Adding Comments to PHP code – Working with Variables – Interpolating Strings.

Operators and Flow Control: PHPs Math operators – Working with Assignment operators – Incrementing/ decrementing values – The PHP string operators – Bitwise operators – Execution operator – PHP Operator precedence – Using the If statement – Comparison operators – logical operators – else , elseif statements – ternary operator – switch, for, while, do while, for each loops- terminating loops, skipping Iterations.

Strings and Arrays: String functions – building arrays- modifying and deleting array elements- handling arrays with loops – sorting arrays – array operators – multidimensional arrays – splitting & merging arrays.

Unit II

Creating Functions : Creating functions – passing functions data, arrays – passing by reference- using default arguments- passing variable numbers of arguments – returning data, arrays, list from functions, nesting functions.

Reading Data in Web Pages : Handling text field – text areas- checkboxes- radio buttons – list boxes- password controls – Hidden controls – Image maps – file uploads and buttons

PHP Browser - Handling Power : Using PHP server variables – HTTP headers – Getting the users browser type – redirecting browsers with HTTP headers – dumping a forms data all at once – handling form data with custom arrays – client side data validation – handling HTML tags in User input.

Unit III

Object-Oriented Programming : .Creating classes – objects – setting access to properties and methods – using constructors to initialize objects – using destructors – Inheritance – overriding methods – overloading methods- Autoloading classes.

File Handling : Opening files – feof – reading text from a file – closing a file – fgetc- file-get-contents, reading a file into an array – checking if the file exists – file size- fread – fscanf – parsing ini-file, fseek, copying files – deleting files – writing and appending a file using fwrite.

Unit IV

Working with Databases: Creating a MYSQL database, creating a new table – putting data into the new database- accessing the database in PHP – updating databases – Inserting new data items - deleting records.

Sessions, Cookies, and FTP: Setting a cookie – Reading a cookie – setting cookies expiration – deleting cookies – working with ftp – downloading files – deleting files – uploading files using FTP – creating and removing directories – sending email – attachments to email storing data in sessions- writing a hit counter using sessions.

Unit V

Ajax : Getting started with Ajax – writing Ajax – Creating the XMLHttpRequest Object – Opening the XMLHttpRequest Object – handling downloaded data- starting the download – passing data to the server with GET, POST - Handling XML – Handling XML with PHP

Drawing Images on the Server : Creating an image **–** Displaying images in HTML pages – drawing lines – rectangles – Ellipses – arcs – polygons – filling in Figures – drawing individual pixels – drawing texts – vertical text – Working with image files – Tiling Images – copying Images .

Text Book:

1.”The PHP Complete Reference” – Steven Holzner – Tata McGraw-Hill Edition.

Reference Books:

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

2. “Ajax Bible”- Steven Holzer , Tata McGraw Hill Edition.

Web References:

1. https://www.w3schools.com/php/
2. https://www.tutorialspoint.com/php/php_object_oriented.htm

COURSE OUTCOMES:

Upon completion of the course "PHP Programming ", the students will be able to

#	Course Outcome
CO1	Compare various array functions
CO2	Define OOPS concept in PHP
CO3	Develop MYSQL databases through PHP Program
CO4	Build images in Webpage
CO5	Elaborate handling XML in PHP using Ajax

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
VI	21UCSME2	PHP Programming	5	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		✓		✓		✓			✓	✓
CO2	✓		✓			✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO4		✓		✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓	✓		✓		✓
CO6										

Number of Matches = 35 Relationship: High

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 – 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

ELECTIVE COURSE III

SOFTWARE ENGINEERING (21UCSME3)

Hours/Week : 5

Credit : 4

COURSE OBJECTIVE:

- To analyze and evaluate various Software Engineering Models
- To develop the software requirements
- To analyze the design concepts and apply the concepts to design architectural, component level & user interface models.
- To explain the types of testing.
- To evaluate software Maintenance cost

UNIT I :

Introduction to Software Engineering : Definitions – Size factors – Quality and Productivity factors.

Planning a Software Project : Introduction – Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure.

UNIT II :

Software Cost Estimation : Cost factors – Cost Estimation Techniques – Staffing-Level Estimation - Estimating software maintenance costs.

Software Requirements Definition : Software Requirements Specification – Formal Specification Techniques.

UNIT III :

Software Design : Fundamental Design Concepts – Modules and Modularization Criteria - Design Notations – Design Techniques.

UNIT IV :

Implementation Issues : Structured Coding techniques – Coding style – Standards and Guidelines – Documentation guidelines

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.

Text Book :

1. "Software Engineering concepts" – Richard Fairley, Tata McGraw Hill MH,1997

Reference Book :

1. " Software Engineering A Practitioner's Approach" – Roger S. Pressman 5th Edition, McGraw Hill.
2. "Software Engineering "- Ian Sommarvilla- Pearson Education Publishing ltd, New Delhi, 2004
3. "Software Engineering Theory and Practice " – Shark Lawrence Pleeges- Pearson Education Publishing ltd, New Delhi, 2001

COURSE OUTCOMES:

Upon Completion of the course "Software Engineering " , the student will be able to

#	Course Outcome
CO1	Gain knowledge of basic software engineering methods and practices and their appropriate applications
CO2	Analyze and Compare software process models such as waterfall and evolutionary models
CO3	Illustrate the software requirements
CO4	Describe the approaches to testing, verification and validation
CO5	Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
VI	21UCSME3	Software Engineering	5	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓			✓	✓	✓	✓	✓	✓
CO2	✓		✓		✓		✓	✓		
CO3		✓	✓	✓		✓		✓		✓
CO4	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO5	✓	✓	✓		✓		✓	✓	✓	✓
CO6										

Number of Matches = 36 Relationship:High

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

ELECTIVE COURSE IV

UNIX AND SHELL PROGRAMMING

Hours/Week : 5

Credit : 4

COURSE OBJECTIVES

- To recall the special features of UNIX system
- To summarize the basic UNIX commands
- To discuss the usage of advanced commands
- To illustrate the use of UNIX tools
- To develop programs using Shell

UNIT I :

File System and Security : Structure of UNIX – history of UNIX –UNIX system environment – File system –Types of file - File access permissions –protecting files –File system hierarchy – Directories and path names.

UNIT II :

Basic commands (more frequently used commands only): passwd –man –Is –pwd – cd – mkdir – cat – head – tail – more – pr – lpr- wc – cp – In – mv – rm – chmod.

UNIT III :

Advanced commands and Administrator commands : ps – who –date – ca- du – find – tty – stty – kill –at –echo – tee – crontab.

UNIT IV :

Unix Tools : grep – sed – tr – awk

UNIT V :

Shell programming : - The login Shell and other Shells - Login Files – Shell variables – Shell Scripts – Commands – Line Substitution.

C Shell : Loops – Expressions – The if structures Multiple choice - The switch Structure – Miscellaneous.

Text Books :

1. "A User Guide to Unix system" - Dr. Rebecca Thomas and Jean Yates - Second Edition, McGraw Hill International Edition, California,(Chapters 1-4,6),1997 - Units I, II, III
2. " Advanced Unix Programmers Guide" - Parat. S - BPB Publications, New Delhi, 1986. (Chapters – Appendix A & B) -For Units IV, V.

Reference Books :

1. " Advanced Programming guide to Unix System V" - Rebecca Thomas, Lawrence R.Rogers, Jean L.Yates – McGraw Hill International Edition, Califonia, 1987.

COURSE OUTCOMES:

Upon Completion of the course "Unix and Shell Programming " , the student will be able to

#	Course Outcome
CO1	Gain knowledge of UNIX environment
CO2	Analyze the syntax of basic commands
CO3	Distinguish administrator commands and user commands
CO4	Explain the function of Unix tools
CO5	Develop programs using shell programming

Relationship Matrix for COs, POs and PSOs

Semester	Code	Title of the Course	Hours	Credits
-	-	Unix and Shell Programming	5	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓			✓		✓		✓
CO2			✓				✓	✓	✓	✓
CO3	✓			✓	✓		✓		✓	
CO4	✓			✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓	✓		✓	✓	✓	✓
Number of Matches =31 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

ELECTIVE COURSE V

OPEN SOURCE TECHNOLOGIES

Hours/ Week :5

Credits :4

COURSE OBJECTIVES:

- To Understand the concept of Open Source Software
- To Explore Linux Commands
- To Provide knowledge about APACHE server
- To Create SQL tables and to do manipulations
- To Connect MySQL with PHP

UNIT I: OPEN SOURCE: Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel.

UNIT II:LINUX Introduction: Linux Essential Commands – File system Concept - Standard Files - The Linux Security Model - Vi Editor - Partitions creation - Shell Introduction - String Processing - Investigating and Managing Processes - Network Clients.

UNIT III:APACHE: Introduction - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation.

UNIT IV:MySQL Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Table Joins - Loading and Dumping a Database.

UNIT V:PHP PHP Introduction- General Syntactic Characteristics - PHP Scripting - Commenting your code - Primitives, Operations and Expressions - PHP Variables - Operations and Expressions Control Statement - Array - Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

Text Book:

1. "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008

Reference book:

1. "Setting Up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004

Web References :

1. https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_open_source_software.htm
2. https://ittutorials.net/open-source/

COURSE OUTCOMES :

Upon completion of the course "Open Source Technologies ", the students will be able to

#	Course Outcome
CO1	Acquire the knowledge about Open Source Systems
CO2	Describe Linux commands
CO3	Learn APACHE environment
CO4	Classify MY SQL commands
CO5	Understand PHP scripts

Relationship Matrix for COs, POs and PSOs

Semester	Code		Title of the Course				Hours		Credits	
III	21PCS07		OPEN SOURCE				6		5	
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓	✓	✓	✓	✓	✓		
CO2	✓	✓			✓		✓	✓	✓	✓
CO3	✓		✓	✓	✓	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓		✓	✓	✓	✓	✓		
Number of Matches = 38 Relationship:High										

Mapping	1-20	21-40	41-60	61-80	81-100
Matches	1-10	11- 20	21 - 30	31-40	41-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SKILL ENHANCEMENT COURSE I

OFFICE AUTOMATION (21UCSSEC1)

Hours / Week : 2

Credits : 2

Course Objectives:

- To explain the concept of the basic use of Windows and Microsoft Office.
- To develop skills in using Word Document features Cut, Copy, Paste, Find and Replace.
- To implement Word Document using Font Styles and Paragraph Alignment.
- To analyze and Design PowerPoint presentations using Auto Layout , Insert Images
- To differentiate the types of Sorting View and to perform Custom Animation.

UNIT-1

Introduction : Working with Windows - Title Bar, Status Bar, Menu bar and Tool bars - Using the Help window - Creating a Shortcut icon - Starting a Program and Opening a Document - Saving and Naming the Document – Creating a Folder - Closing, Deleting and Undeleting a Document - Renaming, Copying and Moving a Document - Finding the Document.

UNIT-2

WORD : Working with Word Documents - Moving, Correcting and Inserting Text - Printing a Document - Editing a Document - Selecting and Copying Text - Formatting - Changing Margins, Line spacing, Text Alignment, Font and Font size - Indenting - Inserting Page Numbers and Breaks.

UNIT-3

Tables : Creating Tables - Auto formatting Table - Inserting, Moving and Resizing Pictures - Spell Checking – Mail Merge.

UNIT-4

Power Point : Creating a PowerPoint Presentation- Creating slides using auto layout – Inserting a new slide – Inserting Pictures – Duplicating existing slides.

UNIT-5

Changing Slide Layouts – Applying Design Templates – Viewing Slide Show – Different Types of View.

TEXT BOOK :

1. Microsoft Office2000 Complete – BPB Publications.

REFERENCE BOOK :

1. Laura Acklen et al, Microsoft Office 97 Professional Essentials, Prentice-Hall India (1998).

Web References:

1. https://www.tutorialspoint.com/word/index.htm
2. https://www.tutorialspoint.com/powerpoint/index.htm

Course Outcomes:

Upon Completion of the course "Microsoft Office " , the student will be able to

#	Course Outcome
CO1	Create documents that demonstrate proficiency in the use of word processing, Find and Replace, Spellcheck
CO2	Analyze different types of Formatting using Font Styles and Paragraph Alignment
CO3	To Construct table with all features
CO4	Remember different types of Auto Layout Presentation and inserting Pictures
CO5	Develop Slideshow Presentation using templates and Animation

SKILL ENHANCEMENT COURSE II

STRUCTURED QUERY LANGUAGE (21UCSSEC2)

Hours / Week : 2

Credits : 2

Course Objectives:

- To learn basic SQL commands
- To illustrate SQL operators and expressions
- To apply various functions in queries
- To perform join and set operations
- To develop queries using views, cursors, procedures and triggers.

UNIT I :

What is SQL? - SQL Commands: SELECT- DISTINCT – WHERE – AND/OR - IN, BETWEEN, LIKE – ORDER BY –GROUP BY - COUNT – CREATE TABLE –DROP TABLE – TRUNCATE TABLE – ALTER TABLE – INSERT – UPDATE – DELETE.

UNIT II:

Operators: Arithmetic –Comparison – Logical

Expressions: Boolean – Numeric – Date

UNIT III:

Numeric Functions: Abs, Ceil, Floor, Power, SQRT, Round, Trunc, mod.

Date Functions: Sysdate, add_months, Last_day, Greatest, Least

String Functions: Upper, Lower, Ltrim, Rtrim, Lpad, Rpad, ASCII, Chr, Concat, Substr.

Trigonometric Functions: Sin, Cos, Tan, Exp, Ln, Log.

Unit IV:

Join and Split table – Set Operators : Union, Intersect, Minus.

Unit V:

Views – Cursors – Procedures – Triggers.

Text Book:

1. The Complete Reference – SQL, James R. Groff, Paul N.Weinberg, Andrew J. Oppel, Third Edition, McGraw Hill Education India, 2008

Reference Book:

1. Oracle –The Complete Reference, George Koch, Kevin Loney, Third Edition, Tata McGraw Hill, 1990.

Web references :

1. https://www.w3schools.com/sql/sql_syntax.asp
2. https://www.tutorialspoint.com/sql/sql-syntax.htm

Course Outcomes:

Upon successful completion of the course, students will be able to

CO#	**Course Outcomes**
CO1	Write simple queries using SQL commands
CO2	Use operators and expressions in queries
CO3	Apply various functions in queries
CO4	Compare join and set operations
CO5	Create SQL queries using views, cursors, procedures and triggers.

NON MAJOR ELECTIVE COURSE I

PRINCIPLES OF INFORMATION TECHNOLOGY (21UCSNME1)

Hours / Week : 2

Credits : 2

COURSE OBJECTIVES

- To Classify the types of Computer and Memory Unit
- To Evaluate various Input and Output devices
- To Learn about Computer Software , Programming language & Data Processing
- Explain about the Computer Networks, Topologies and Architecture.
- Discuss about Internet and Web Browsers.

UNIT I :

Introduction to Computers : Introduction – Types of Computer.

Classification of Computer : Introduction – Micro Computers – Mini Computers – Mainframe Computers – Super Computers – Network Computers.

Anatomy of a Digital Computer : Functions – Components .

Memory Unit : RAM – ROM – PROM – EPROM – EEPROM .

UNIT II :

I/O Devices : Input Device : Introduction – Keyboard – Mouse – Trackball – Joystick – Scanners – Digital Camera –MICR – OCR -- OMR – Bar Code Reader – Touch Screen – Light pen.

Output Device: Introduction – Monitor – Classification of Monitors (Based on Colour and Signals) – Printer**:** Impact printer – Non Impact Printer , Plotters.

UNIT III :

Introduction to Computer Software : Operating systems – Utilities – Compilers and Interpreters – Word Processors – Spreadsheets – DBMS – Image Processors .

Programming Languages : Machine Language – Assembly Language – High Level Language .

Data Processing : Introduction – Data Vs Information – File Processing - Data Base Processing.

UNIT IV :

Computer Networks : Modems- Communications Media – Types of Networks – Network Topologies – Network Protocols – Network Architecture.

UNIT V :

Internet and World Wide Web :.Introduction – Special about Internet – Internet Access – Internet Basics – Protocols – Addressing – Web Browsers.

Text Book :

"Fundamentals of Information Technology", Alexis Leon & Mathews Leon, Leon Vikas.

COURSE OUTCOMES :

Upon Completion of the course " Principles of Information Technology" , the student will be able to

	Course Outcomes
CO1	Identify the Types of Computer and Memory Units.
CO2	Analyze the Various Input & Output Device
CO3	Develop the Computer Software & Programming Language
CO4	Compare the Computer Networks , Topologies
CO5	Acquire Skills and Knowledge in Internet and Web browsers

NON MAJOR ELECTIVE COURSE II

HTML and Web Design(21UCSNME2)

Hours / Week : 2

Credits : 2

COURSE OBJECTIVES

- To define the Home Page of HTML & Sample Documents.
- To design the Heading and Body Section.
- To List the Order , UnOrder and the Nested Lists.
- To Create the Tables Using HTML tags.
- To Construct the Frames and Nested Frame Set.

UNIT I

Introduction to HTML : Designing a home page – History of HTML – HTML generations- HTML document – Anchor tag – Hyper Links – Sample HTML documents .

Head and Body Sections : Header section – Title – Colorful Web Page – Comment Lines.

UNIT II

Designing the Body Section : Heading Printing – Aligning the heading – Horizontal rule – Paragraph – Tab settings – Images and Pictures – Embedding images.

UNIT III

Ordered Unordered List : Unordered Lists – Headings in a List – Ordered Lists – Nested Lists.

UNIT IV

Table Handling : Table Creation – Width of table cells –Cell Spanning Multiple Rows / Columns Coloring Cells - Column Specification.

UNIT V

Frames : Frameset definition – Frame Definition – Nested Frame sets.

Text Book:

1."World Wide Web design with HTML" – C.Xavier – Tata McGraw-Hill Publications

Reference Books:

1."Web design in Nut Shell" - Jennifer Niederst – O'Refilly- Shroff publishers and Distributors Pvt. Ltd.

COURSE OUTCOMES:

Upon Completion of the course "HTML" , the student will be able to

	Course Outcomes
CO1	Develop the Home page using HTML tags
CO2	Build the Web page with Head & Body Section
CO3	Organize the Order , Unordered & Nested lists
CO4	Model the Tables With Rows and Columns
CO5	Discover the Frames & Nested Frame Set.

SELF STUDY COURSE I

WEB DESIGNING (21UCSSS1)

Credit : 2

Course Objective :

- To define the home page of HTML and Sample documents.
- To design the heading and body section.
- To design the page using lists.
- To create tables using HTML tags.
- To construct frames and nested frameset.

UNIT I

Introduction to HTML : Designing a home page – History of HTML – HTML generations- HTML document – Anchor tag – Hyper Links – Sample HTML documents .

Head and Body Sections : Header section – Title – Colorful Web Page – Comment Lines.

UNIT II

Designing the Body Section : Heading Printing – Aligning the heading – Horizontal rule – Paragraph – Tab settings – Images and Pictures – Embedding images.

UNIT III

Ordered Unordered List : Unordered Lists – Headings in a List – Ordered Lists – Nested Lists.

UNIT IV

Table Handling : Table Creation – Width of table cells –Cell Spanning Multiple Rows / Columns Coloring Cells - Column Specification.

UNIT V

Frames : Frameset definition – Frame Definition – Nested Frame sets.

Text Book:

1."World Wide Web design with HTML" – C.Xavier – Tata McGraw-Hill Publications

Reference Books:

1."Web design in Nut Shell" - Jennifer Niederst – O'Refilly- Shroff publishers and Distributors Pvt. Ltd.

COURSE OUTCOMES:

Upon Completion of the course "Web Designing" , the student will be able to

	Course Outcomes
CO1	Develop the Home page using HTML tags
CO2	Build the Web page with Head & Body Section
CO3	Organize the Order , Unordered & Nested lists
CO4	Design the Tables With Rows and Columns
CO5	Discover the Frames & Nested Frame Set.

SELF STUDY COURSE II

VISUAL PROGRAMMING (21UCSSS2)

Credits : 2

Course Objectives :

- To inculcate knowledge on programming and project development using visual basic.
- To learn the fundamentals of VB such as data types and control structures.
- To improve the knowledge about standard controls of VB.
- To introduce the advanced controls of VB.
- To inculcate knowledge about the data controls of VB.

UNIT I :

Mastering the Integrated Development Environment : Introducing VB – Learning the IDE Features - Menu Bar – The Tool Bar- The Project Explorer – The Properties Window - The Form Layout Window – The Tool Box – The Form designer – The Object Browser.

UNIT II :

Working with Forms : The Anatomy of a Form – The Border – The Title Bar – The Caption – The Control Menu – The Minimize Button – The Maximize/Restore Button – The Close Button – Working with Form Properties – Introducing Form events – Introducing Form Methods – Working with MDI Forms – Creating an MDI.

UNIT III :

Selecting and Using Controls : Introducing Controls - Using Command Buttons - Using Text Boxes - Using Labels - Using Option Buttons – Using Check Boxes **–** Using Combo Boxes – Using Timers.

UNIT IV :

Selecting and Using Controls : Using Frame Controls – Using List Boxes Using Image Object – Using Picture Boxes –Using Scroll Bars – Using Drive List – Using Directory List Boxes – Using File List Boxes .

UNIT V :

Storing and Retrieving Data : Using Data Controls – Creating a Database Table.

Working with the Mouse : Detecting Mouse events – Using Drag and Drop Operations.

Text Book :

1. " Visual Basic 6" – STEVE BROWN.

Reference Book :

1. " Programming with Visual Basic 6.0" – Gary Cornell

COURSE OUTCOMES:

Upon Completion of the course "Visual Programming" , the student will be able to

	Course Outcomes
CO1	Know about features and properties of VB.
CO2	Efficiently handle data types and control structures.
CO3	Achieve knowledge about standard controls of VB.
CO4	Handle advanced controls and data controls.
CO5	Develop the projects using VB.

SELF STUDY COURSE III

FUNDAMENTALS OF PHOTOSHOP(21UCSSS3)

Credits : 2

COURSE OBJECTIVES

- To understand the basics of principles of Photoshop.
- To understand the tools and tricks.
- To get the knowledge about filters.
- To understand the text, effects.
- To gain the knowledge about plug-ins.

UNIT - I:

Getting Started : The Basics - Opening and Saving – Working with Files – Saving your work – Undoing and Redoing - Selection Modes – Transformations – Resizing – Rotating – Flipping – Selection Transformations - Paintbrushes and Art Tools – The Brushes Palette – Brushes - Moving Paint – Smudges.

UNIT - II:

More Tools and Tricks : Advanced Painting Techniques – Simulating Different Media - Layers –Using The Layers Palette – Working With Multiple Layers - Using Masks –Applying Masks – Using Quick Mask.

UNIT - III:

Fun with Filters : Filters That Improve Picture –Sharpen Filters – Blur Filters – Fading Filters - Filters To Make Picture Artistic – Artistic Filters – Brush Strokes – sketch Filters - Filters To Distort and Other Funky Effects – Distort Filters – Pixelate Filters – Stylize – Combining Filters

UNIT - IV:

Text Effects : Adding Type to pictures – The Type Tools – Setting Type – Creating Drop Shadows – Cutting and Filling Type – Adding Glows – Creating Bevel and Emboss Effects.

UNIT - V:

Getting Plugged In

Wrapping Text – Checking your Spelling - Special Effects and Useful Tricks - Compositing – Photo Repair –Black and White.

Text Book :

1." Teach Yourself Adobe Photoshop 7 in 24 hours"– Carla Rose Sams - Edition 2002.

Reference Books:

1. "Multimedia and Web Design" - Vikas Gupta - Dream Tech Press 2007.
2. "Photoshop CS" , Shruthilal - Firewall Media 2011.

Web references:

a. https://www.guru99.com/photoshop-tutorials.html/
b. https://www.photoshopessentials.com/

COURSE OUTCOMES:

Upon Completion of the course "Fundamentals of Photoshop " , the student will be able to

	Course Outcome
CO1	Understand the basic principles of Photoshop palette
CO2	Efficiently handle the layers and masks
CO3	Gain the knowledge about filters
CO4	Apply the text, effects, and type tools
CO5	Implement special effects