POOMPUHAR COLLEGE (AUTONOMOUS)

OF THE TAMIL NADU HR & CE DEPARTMENT
MELAIYUR - 609 107

DEPARTMENT OF COMPUTER SCIENCE

Bachelor of Computer Applications (B.C.A)

Programme Structure and Scheme of Examination (under CBCS)
(Applicable to the candidates admitted from the academic year 2023 -2024 onwards)

Course Code	Part	Study Components & Course Title	Credit	Hours/Week	Maximum Marks		
					CIA	ESE	Total
		SEMESTER – I					
23UTAML11 23UHINL11 23UFREL11	I	Language– I பொது தமிழ்-I Hindi-I French-I	3	6	25	75	100
23UENGL12	II	General English – I	3	6	25	75	100
23UBCAC13	III	Core – I- Python Programming	5	5	25	75	100
23UBCAP14		Core –II - Python Programming Lab	5	5	25	75	100
23UNUME15 23USMAE15		Elective – I: Numerical Methods (or) Statistical Methods and its Application-I	3	4	25	75	100
	IV	Skill Enhancement Course – 1 (NME-I	2	2	25	75	100
23UBCAF17		Foundation Course: Programming in C Lab	2	2	25	75	100
		Total	23	30			700
		SEMESTER – II					
23UTAML21 23UHINL21 23UFREL21	I	Language– II பொது தமிழ்-II Hindi-II French-II	3	6	25	75	100
23UENGL22	II	General English – II	3	6	25	75	100
23UBCAC23	III	Core – III- Object Oriented Programming Concepts Using C++	5	5	25	75	100
23UBCAP24		Core –IV: C++ Programming Lab	5	5	25	75	100
23URMTE25 23USMAE25		Elective – II: Resource Management Techniques (or) Statistical Methods and its Applications-II	3	4	25	75	100
	IV	Skill Enhancement Course – 2 (NME-II)-Multimedia Systems	2	2	25	75	100
23USECG27		Skill Enhancement Course – 3 Internet and its Applications (Common Paper)	2	2	25	75	100
		Total	23	30			700

Non-major (NME) Electives offered to other Departments

23UBCAN16	IV	Introduction to HTML	2	2	25	75	100
23UBCAN26	IV	Multimedia Systems	2	2	25	75	100

SEMESTER:I PART: III	CORE-I : 23UBCAC13 : PYTHON PROGRAMMING	CREDIT:5 HOURS:5/W

COURSE OBJECTIVES

1. To make students understand the concepts of Python programming
2. To apply the OOPs concept in PYTHON programming
3. To impart knowledge on demand and supply concepts
4. To make the students learn best practices in PYTHON programming
5. To know the costs and profit maximization

UNIT I : **Basics of Python Programming** **Hours:15**

History of Python-Features of Python-Literal-Constants-Variables - Identifiers– Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Indentation- Operators-Expressions,Python Arrays: Defining and Processing Arrays – Array methods**.**

UNIT II:Control Statements **Hours:15**

Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements

.

UNIT III:Functions **Hours:15**

Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Keyword Arguments, Default Arguments - Recursion. Python Strings: String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function –

UNIT IV:Lists **Hours:15**

Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries

UNIT V:Python File Handling **Hours:15**

Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files**.**

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1. Learn the basics of python, Do simple programs on python,

Learn how to use an array.

2. Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.
3. Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.
4. Work with List, tuples and dictionary, Write program using list, tuples and dictionary.
5. Usage of File handlings in python, Concept of reading and writing files, Do programs using files.

Text Books (In API Style)

1. ReemaThareja, “Python Programming using problem solving approach”, First Edition, 2017, Oxford University Press.
2. Dr. R. NageswaraRao, “Core Python Programming”, First Edition, 2017, Dream tech Publishers

Supplementary Readings

1. VamsiKurama, “Python Programming: A Modern Approach”, Pearson Education.
2. Mark Lutz, ”Learning Python”, Orielly.
3. Adam Stewarts, “Python Programming”, Online.
4. Fabio Nelli, “Python Data Analytics”, APress
5. Kenneth A. Lambert, “Fundamentals of Python – First Programs”, CENGAGE Publication.

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**3**	**2**	**2**	**3**	**3**	**3**
CO 2	**3**	**2**	**2**	**3**	**2**	**3**
CO 3	**3**	**2**	**2**	**3**	**2**	**2**
CO 4	**3**	**2**	**2**	**3**	**2**	**3**
CO 5	**3**	**2**	**2**	**3**	**3**	**3**
Weightage of course contributed to each PSO	15	10	10	15	13	14

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:I PART: III	CORE-II: 23UBCAP14: PYTHON PROGRAMMING LAB	CREDIT: 5 HOURS: 5/W

COURSE OBJECTIVES

1. Be able to design and program Python applications.
2. Be able to create loops and decision statements in Python.
3. Be able to work with functions and pass arguments in Python.
4. Be able to build and package Python modules for reusability.

LIST OF EXPERIMENTS

1. Program using variables, constants, I/O statements in Python.
2. Program using Operators in Python.
3. Program using Conditional Statements.
4. Program using Loops.
5. Program using Jump Statements.
6. Program using Functions.
7. Program using Recursion.
8. Program using Arrays.
9. Program using Strings.
10. Program using Modules.

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1. Demonstrate the understanding of syntax and semantics
2. Identify the problem and solve using PYTHON programming techniques.
3. Identify suitable programming constructs for problem solving.
4. Analyze various concepts of PYTHON language to solve the problem in an efficient way.
5. Develop a PYTHON program for a given problem and test for its correctness.

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**2**	**2**	**2**	**2**	**3**	**2**
CO 2	**2**	**1**	**3**	**2**	**-**	**2**
CO 3	**3**	**3**	**1**	**1**	**1**	**2**
CO 4	**2**	**3**	**3**	**1**	**-**	**1**
CO 5	**3**	**2**	**3**	**1**	**1**	**-**
Weightage of course contributed to each PSO	12	11	12	7	5	7

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:I PART: IV	SKILL ENHANCEMENT COURSE-I (FOUNDATION COURSE) **23UBCAF17 : PROGRAMMING IN C LAB**	CREDIT:2 HOURS:2/W

COURSE OBJECTIVES

- It aims to train the student to the basic concepts of the C-programming language
- To improve the programming skills through C language

LIST OF EXPERIMENTS

I Recursion

1. GCD of two numbers
2. Fibonacci sequence
3. Maximum & Minimum

II String Manipulation

1. Counting the number of vowels, consonants.
2. Reverse a string and check for palindrome.
3. To count lines.

III Matrix Manipulation

1. Addition
2. Subtraction
3. Multiplication

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1. Remember the program structure of C with its syntax and semantics
2. Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
3. Apply the programming principles learnt in real-time problems
4. Analyze the various methods of solving a problem and choose the best method
5. Code, debug and test the programs with appropriate test cases

.

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**1**	**2**	**2**	**2**	**2**	**-**
CO 2	**2**	**2**	**2**	**2**	**-**	**2**
CO 3	**3**	**2**	**2**	**1**	**1**	**-**
CO 4	**3**	**2**	**2**	**1**	**-**	**1**
CO 5	**1**	**2**	**2**	**2**	**2**	**3**
Weightage of course contributed to each PSO	7	10	10	18	15	6

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:II PART: III	CORE-III: 23UBCAC23 : OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++	CREDIT:5 HOURS:5/W

COURSE OBJECTIVES

1. Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
2. Understand dynamic memory management techniques using pointers, constructors, destructors, etc
3. Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
4. Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
5. Demonstrate the use of various OOPs concepts with the help of programs.

UNIT I :**Introduction to C++** **Hours:15**

key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If ..else, jump, goto, break, continue, Switch case statements - Loops in C++ :for, while, do - functions in C++ - inline functions – FunctionOverloading.

UNIT II:Classes and Objects **Hours:15**

.Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects – Overloading member functions -Constructor and destructor with static members.

UNIT III: Operator Overloading **Hours:15**

Overloading unary, binary operators –type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal,Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT IV: Pointers **Hours:15**

Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes andBase classes – Arrays – Characteristics – array of classes – Memory models – new and deleteoperators – dynamic object – Binding, Polymorphism and Virtual Functions.

UNIT V: Files **Hours:15**

File stream classes – file modes – Sequential Read / Write operations – Binary and ASCIIFiles – Random Access Operation– Exception Handling - String – Declaring and Initializing string objects .

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1.Remember the program structure of C with its syntax and semantics

2. Understand the programming principles in C (data types, operators, branching and looping,

arrays, functions, structures, pointers and files)

3. Apply the programming principles learnt in real-time problems

4. Analyze the various methods of solving a problem and choose the best method

5. Code, debug and test the programs with appropriate test cases

.

Text Books (In API Style)

1 E. Balagurusamy, "Object-Oriented Programming with C++", TMH 2013, 7th Edition.

Supplementary Readings

1. Ashok N Kamthane, "Object-Oriented Programming with ANSI and Turbo C++",Pearson Education 2003.
2. Maria Litvin& Gray Litvin, "C++ for you", Vikas publication 2002.

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**3**	**2**	**1**	**-**	**-**	**1**
CO 2	**2**	**2**	**2**	**1**	**-**	**-**
CO 3	**3**	**1**	**1**	**-**	**1**	**-**
CO 4	**1**	**2**	**1**	**2**	**2**	**1**
CO 5	**3**	**2**	**1**	**2**	**3**	**2**
Weightage of course contributed to each PSO	12	9	6	5	6	4

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:II PART: III	CORE-IV: 22UBCAP24: C++ PROGRAMMING LAB	CREDIT: 5 HOURS: 5/W

COURSE OBJECTIVES

1. Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
2. Understand dynamic memory management techniques using pointers, constructors, destructors, etc
3. Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
4. Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
5. Demonstrate the use of various OOPs concepts with the help of programs

LIST OF EXPERIMENTS

1. Write a C++ program to demonstrate function overloading
2. Write a C++ program to demonstrate Class and Objects
3. Write a C++ program to demonstrate the concept of Passing Objects to Functions
4. Write a C++ program to demonstrate Constructor and Destructor
5. Write a C++ program to demonstrate Unary Operator Overloading
6. Write a C++ program to demonstrate Binary Operator Overloading
7. Write a C++ program to demonstrate:
    - Single Inheritance
    - Multilevel Inheritance
8. Write a C++ program to demonstrate Virtual Functions.
9. Write a C++ program to find the Biggest Number using Command Line Arguments
10. Write a C++ program to demonstrate Exception Handling

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1. Remember the program structure of C with its syntax and semantics
2. Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
3. Apply the programming principles learnt in real-time problems
4. Analyze the various methods of solving a problem and choose the best method
5. Code, debug and test the programs with appropriate test cases

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**3**	**3**	**3**	**3**	**1**	**2**
CO 2	**2**	**3**	**3**	**3**	**1**	**2**
CO 3	**2**	**3**	**3**	**3**	**1**	**2**
CO 4	**2**	**3**	**3**	**3**	**1**	**2**
CO 5	**2**	**3**	**3**	**3**	**1**	**2**
Weightage of course contributed to each PSO	11	15	15	15	5	10

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:I	SKILL ENHANCEMENT COURSES-1 (NME-1)	CREDIT:2
PART: IV	23UBCAN16 : INTRODUCTION TO HTML	HOURS:2/W

COURSE OBJECTIVES

1. Insert a graphic within a web page
2. Create a link within a web page.
3. Create a table within a web page
4. Insert heading levels within a web page.
5. Insert ordered and unordered lists within a web page. Create a web page.

UNIT I : **Introduction** **Hours:6**

Web Basics: What is Internet – Web browsers–What is Web page
HTML Basics:Understanding tags.

UNIT II : Tag Structure **Hours:6**

Tags for Document structure (HTML, Head, Body Tag).Block level text elements: Headings paragraph (<p> tag)–Font style elements:(bold, italic, font, small, strong, strike, big tags).

UNIT III : Lists **Hours:6**

Types of lists:Ordered, Unordered – Nesting Lists–Other tags: Marquee, HR, BR-Using Images –Creating Hyperlinks.

UNIT IV: Tables **Hours:6**

Creating basic Table, Table elements, Caption–Table and cell alignment–Rowspan ,Colspan–Cell padding

UNIT V : Frames **Hours:6**

Frames: Frameset–Targeted Links–No frame–Forms:Input, Text area, Select, Option.

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1 .Knows the basic concept in HTMLConcept of resources in HTML
2. Knows Design concept Concept of Meta DataUnderstand the concept of save the files.
3.Understand the page formatting Concept of list
4. Creating Links.Know the concept of creating link to email address
5. Concept of adding imagesUnderstand the table creation.

Text Books (In API Style)

1. "Mastering HTML5 and CSS3 Made Easy", TeachUComp Inc., 2014.Dr. R. NageswaraRao, "Core Python Programming", First Edition, 2017, Dream tech Publishers
2. Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"

Supplementary Readings

1.https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf.

2.https://www.w3schools.com/html/default.asp

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
Weightage of course contributed to each PSO	14	15	14	14	15	15

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:II	SKILL ENHANCEMENT COURSES-2 (NME-II)	CREDIT:2
PART: IV	23UBCAN26 : MULTIMEDIA SYSTEMS	HOURS:2/W

COURSE OBJECTIVES

1. Understand the definition of Multimedia
2. To study about the Image File Formats, Sounds Audio File Formats
3. Understand the concepts of Animation and Digital Video Containers
4. To study about the Stage of Multimedia Project
5. Understand the concept of Ownership of Content Created for Project Acquir Talent

UNIT I : **Multimedia Definition** **Hours:6**

Use Of Multimedia-Delivering Multimedia- Text:About Fonts and Faces - Using Text in Multimedia -Computers and Text Font Editing and DesignTools-HypermediaandHypertext.

UNIT II:Images **Hours:6**

Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -DigitalAudio-MidiAudio-Midivs.DigitalAudio-MultimediaSystemSoundsAudio File Formats -Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project.

UNIT III:Animation **Hours:6**

The Power of Motion-Principles of Animation-Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays-DigitalVideoContainers-ObtainingVideo Clips -ShootingandEditingVideo

UNIT IV:Making Multimedia **Hours:6**

The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs - An Authoring Systems Needs-MultimediaProductionTeam.

UNIT V:PlanningandCosting **Hours:6**

TheProcessofMakingMultimedia-Scheduling-Estimating - RFPs and Bid Proposals. Designing and Producing - Content andTalent:AcquiringContent-OwnershipofContentCreatedforProject-AcquiringTalent

COURSE OUTCOMES

After completing the Course successfully, the student will be able to

1.understand the concepts, importance, application and the process of developing multimedia

2.to have basic knowledge and understanding about image related processing

3.To understand the framework of frames and bit images to animations

4.Speaks about the multimedia projects and stages of requirement in phases of project.

5.Understanding the concept of cost involved in multimedia planning,

Text Books (In API Style)

1.TayVaughan,"Multimedia:MakingItWork",8thEdition,Osborne/McGraw-Hill,2001. “

Supplementary Readings

1.RalfSteinmetz&KlaraNahrstedt"MultimediaComputing,Communication&Applications" ,PearsonEducation,2012

Mapping with Programme Outcomes:

CO/PSO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO 1	**3**	**2**	**3**	**3**	**2**	**1**
CO 2	**3**	**2**	**3**	**3**	**2**	**1**
CO 3	**3**	**2**	**3**	**3**	**2**	**1**
CO 4	**3**	**2**	**3**	**3**	**1**	**1**
CO 5	**3**	**3**	**3**	**3**	**1**	**1**
Weightage of course contributed to each PSO	15	11	15	15	8	5

S-Strong-3 M-Medium-2 L-Low-1

SEMESTER:II PART: Iv	Skill enhancement courses-3 (NME-II) **Internet and its Applications**	CREDIT:2 HOURS:2/W

INTERNET AND ITS APPLICATIONS

UNIT -I

Introduction To The Internet: Computer in Business – Networking – Internet – E-mail – Resource Sharing – Gopher – World Wide Web – Telnet – Bullet in board Service – Wide Area Information Service.

UNIT – II

Internet Technologies: Modem - Internet addressing – Physical connections – Telephone Lines – Internet browsers – Internet Explorer – Netscape Navigator.

UNIT - III

Introduction to HTML: Designing a home page – HTML documents – Anchor tag – Hyperlinks.

UNIT – IV

Traditional text and formatting – tables - images - frames

UNIT - V

Case Study: Online Passport – Online Gas Services – Online Train Reservation – Tamil nadu government services

TEXTBOOKS

1. C Xavier, "World Wide Web with HTML", Tata McGraw Hill Education, 2000.
2. H.M.Deital, P.J. Deital,"Internet and World Wide Web – How to Program", 4th Edition "PHI Learning.

REFERENCE WEB SITES

1. http://www.ebharatgas.com
2. http://passportindia.gov.in
3. https://www.irctc.co.in
4. http://www.tn.gov.in

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	**1**	**2**	**2**	**2**	**2**	**-**
CO 2	**2**	**2**	**2**	**2**	**-**	**2**
CO 3	**3**	**2**	**2**	**1**	**1**	**-**
CO 4	**3**	**2**	**2**	**1**	**-**	**1**
CO 5	**1**	**2**	**2**	**2**	**2**	**3**
Weightage of course contributed to each PSO	10	10	10	8	5	6

S-Strong-3 M-Medium-2 L-Low-1