CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK

SEMESTER III

CourseCode :CC5	DATA STRUCTURES AND COMPUTER ALGORITHMS		Credits :5
LectureHours:(L) perweek : 5	**TutorialHours: (T)perweek**	**LabPractice Hours: (P)perweek**	**Total:(L+T+P) perweek : 5**
CourseCategory: Core	**Year : II Semester: III**	**AdmissionYear:2023-2024**	
Pre-requisite	Basic knowledge in data and representations		
Linksto otherCourses			

LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field)

- To impart the basic concepts of data structures and algorithms.

- To acquaint the student with the basics of the various data structures and make the students knowledgeable in the area of data structures.

- This course also gives insight into the various algorithm design techniques.

CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn)

CO1: To introduce the concepts of Data structures and to understand simple linear data structures.

CO2: Learn the basics of stack data structure, its implementation and application.

CO3: Use the appropriate data structure in context of solution of given problem and demonstrate
a familiarity with major data structures.

CO4: To introduce the basic concepts of algorithms

CO5: To give clear idea on algorithmic design paradigms like Dynamic Programming, Backtracking, Branch and Bound

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)

Units	Contents	RequiredHours

I	**INTRODUCTION TO DATA STRUCTURES:** Data Structures: Definition- Time & Space Complexity, Arrays: Representation of arrays, Applications of arrays, sparse matrix and its representation. **Linear list:** Singly linked list implementation, insertion, deletion and searching operations on linear list .**Circular linked list:** implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists- Dynamic Storage management.	**15**
II	**STACKS:** Operations, array and linked representations of stack, stack applications, infix to postfix conversion, postfix expression evaluation, recursion implementation.	**15**
III	**QUEUES, TREES & GRAPHS: Queues**: operations on queues, array and linked representations. **Circular Queue:** operations,, applications of queues. **Trees:** Definitions and Concepts- Representation of binary tree, Binary tree traversals (Inorder, Postorder , preorder), Binary search trees **Graphs** : Representation of Graphs- Types of graphs -Breadth first traversal – Depth first traversal- -Applications of graphs .	**15**
IV	**INTRODUCTION TO ALGORITHMS:** **INTRODUCTION**: Definition of Algorithms- Overview and importance of algorithms- pseudocode conventions, Asymptotic notations, practical complexities.**Divide-and-Conquer:** :	**15**
	General Method – Binary Search- Quick Sort- Merge Sort.**Greedy Method:** General method- Knapsack problem- Tree vertex splitting- Job sequencing with deadlines.	
V	**DYNAMIC PROGRAMMING, BACKTRACKING & BRANCH &BOUND :Dynamic programming**: General method, Multistage Graphs, All pairs shortest path, Single source shortest path. **Backtracking:** General method, 8 Queens, Graph coloring, Hamiltonian cycle. **Branch & Bound**: General method, Travelling salesperson problem.	**15**

LearningResources:

- **RecommendedTexts**

  1. Ellis Horowitz , SartajSahni, Susan Anderson Freed, Second Edition ,

  "Fundamentals of Data in C", Universities Press

  2. E. Horowitz, S. Sahni and S. Rajasekaran, Second Edition ,"Fundamentals of

  Computer Algorithms " Universities Press

- **ReferenceBooks:**

  1.   Seymour Lipschutz ,"Data Structures with C", First Edition, Schaum"s outline

  series in computers, Tata McGraw Hill.

  2.   .2. R.Krishnamoorthy and G.IndiraniKumaravel, Data Structures using C, Tata

  McGrawHill – 2008.

  3.   A.K.Sharma, Data Structures using C , Pearson Education India,2011.

  4.   . G. Brassard and P. Bratley, "Fundamentals of Algorithms", PHI, New Delhi,

  1997.

  5.   4, . A.V. Aho, J.E. Hopcroft, J.D. Ullmann,, "The design and analysis of

  Computer 6.Algorithms", Addison Wesley, Boston, 1974

  7.   5. Thomas H. Cormen, C.E. Leiserson, R L.Rivest and C. Stein, Introduction to

  Algorithms, Third edition, MIT Press, 2009

  8.   SanjoyDasgupta, C.Papadimitriou and U.Vazirani , Algorithms , Tata McGraw-

  Hill, 2008.

- **WebResources :** Web resources from NDL Library, E-content from open source

  libraries

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome
CO1	Understand the basic concept of data structures and demonstrate basic operations of an array
CO2	Discuss various types of linked lists, it's operations & simple applications
CO3	Demonstrate basic operations of stacks, queues, circular queues and applications.
CO4	Classify the trees and know their properties & operations
CO5	Have a knowledge on various graph representation & various internal sorting Methods

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3
CO2	3	3	3	2	3
CO3	2	3	3	2	2
CO4	3	2	3	3	3
CO5	3	3	3	3	3

3 - Strong   2 - Medium   1- Low

CourseCode: CC6	**DATASTRUCTURESANDCOMPUTER ALGORITHMS LAB**		**Credits: 5**
LectureHours:(L)	**TutorialHours: (T)perweek**	**LabPractice Hours: (P)perweek: 5**	**Total:(L+T+P) perweek: 5**
CourseCategory: Core	**Year&Semester: II Year & III Semester**		**AdmissionYear: 2023-2024**
Pre-requisite	Basic Programming debugging skills		

LearningObjectives(forteachers:whattheyhavetodointheclass/lab/field)

- To impart the basic concepts of data structures and algorithms.

- To acquaint the student with the basics of the various data structures and make the

   students knowledgeable in the area of data structures.

   This course also gives insight into the various algorithm design techniques.

CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn)
CO1: To introduce the concepts of Data structures and to understand simple linear data structures.
CO2: Learn the basics of stack data structure, its implementation and application.
CO3: Use the appropriate data structure in context of solution of given problem and demonstrate
a familiarity with major data structures.
CO4: To introduce the basic concepts of algorithms
CO5: To give clear idea on algorithmic design paradigms like Dynamic Programming, Backtracking, Branch and Bound

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)		
	List of Exercises:	**RequiredHours**
	Section A **(ProgramsfromDataStructuresUsingC)**	**75**
	• Write a program in ''C'' to implement Stack as an array. • Writeaprogramin''C''toimplement Stackasalinkedlist. • Writeaprogramin''C''toconverttheInfixexpressionto Postfixexpressionusingstack. • Writeaprogramin''C''toconvertInfixexpressiontoPre fixexpressionusingStack. • Write a program in ''C'' to implement Queue as an rray. • Writeaprogramin''C''toimplementQueueasalinked list. • Writeaprogramin''C''toimplementBinarytreetravers als. • Writeaprogramin''C''toimplementBinarySearchTre e. SectionB • Write a program in ''C++'' to perform Bubble Sort • Writeaprogramin''C++''toperformInsertionSort • Write a program in ''C++'' to perform Merge Sort • Write a program in ''C++'' to perform Quick Sort • Writeaprogramin''C++''toperformSelectionSort • Writeaprogramin''C++''toperformLinearSearch • Writeaprogramin''C++''toperformBinarySearch • Write a menu driven program in ''C++'' to insert data in circular queue and display the queue 16. Writea programin''C++'' toinsertdata ina binarysearchtreeand display asinorder,preorderandpost order	

ExtendedProfessionalComponent(isapartofinternalcomponent only,Notto be included in the	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminationsUPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/otherstobesolved(Tobe discussedduringtheTutorialhour)	

ExternalExaminationquestion paper)		
Skillsacquiredfrom the course	Knowledge,ProblemSolving,Analyticalability,Professional Competency,ProfessionalCommunicationandTransferrable Skill	

LearningResources:

- **RecommendedTexts**

    1. Ellis Horowitz , SartajSahni, Susan Anderson Freed, Second Edition , "Fundamentals of Data in C", Universities Press

    2. E. Horowitz, S. Sahni and S. Rajasekaran, Second Edition ,"Fundamentals of Computer Algorithms " Universities Press

- **ReferenceBooks:**

    1.   Seymour Lipschutz ,"Data Structures with C", First Edition, Schaum"s outline series in computers, Tata McGraw Hill.

    2.   .2. R.Krishnamoorthy and G.IndiraniKumaravel, Data Structures using C, Tata McGrawHill – 2008.

    3.   A.K.Sharma, Data Structures using C , Pearson Education India,2011.

    4.   . G. Brassard and P. Bratley, "Fundamentals of Algorithms", PHI, New Delhi, 1997.

    5.   4, . A.V. Aho, J.E. Hopcroft, J.D. Ullmann,, "The design and analysis of Computer 6.Algorithms", Addison Wesley, Boston, 1974

    7.   5. Thomas H. Cormen, C.E. Leiserson, R L.Rivest and C. Stein, Introduction to Algorithms, Third edition, MIT Press, 2009

    WebResources : Web resorces from NDL Library, E-content from open sourcelibraries

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3
CO2	3	3	3	2	3
CO3	2	3	3	2	2
CO4	3	2	3	3	3
CO5	3	3	3	3	3

3 - Strong   2 - Medium   1- Low

CourseCode-SEC4	**CS6: Practical : Python Programming Lab**		**Credits : 1**
LectureHours:(L) perweek:	**TutorialHours: (T)perweek**	**LabPractice Hours: 1 perweek**	**Total:(L+T+P) perweek: 1**
CourseCategory: Skill Enhancement Course	**Year&Semester: II Year III Semester**		**AdmissionYear: 2023-2024**
Pre-requisite	Basic of programming skill		

LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field)

- Acquire programming skills in core Python.
- Acquire Object-oriented programming skills in Python.
- Develop the skill of designing graphical-user interfaces (GUI) in Python.
- Develop the ability to write database applications in Python.
- Acquire Python programming skills to move into specific branches.

CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn)

CO1: To understand the problem solving approaches

CO2: To learn the basic programming constructs in Python

CO3: To practice various computing strategies for Python-based solutions to real world problems

CO4: To use Python data structures - lists, tuples, dictionaries.

CO5: To do input/output with files in Python.

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)

	List of Exercises:	**Required Hours**

	1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user''s choice.
	
	2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
	
	    Grade A: Percentage >=80 Grade B: Percentage >=70 and 80
	    Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60
	    Grade E: Percentage < 40
	
	3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
	
	4. Write a Python script that prints prime numbers less than 20.
	
	5. Program to find factorial of the given number using
		15

recursive function.

6. Write a Python program to count the number of even andodd numbers from array of N numbers.

7. Write a Python class to reverse a string word by word.

8. Given a tuple and a list as input, write a program to count the occurrences of all items of the list in the tuple. (Input : tuple = ('a', 'a', 'c', 'b', 'd'), list = ['a', 'b'], Output : 3)

9. Create a Savings Account class that behaves just like a BankAccount, but also has an interest rate and a method that increases the balance by the appropriate amount of interest (Hint:use Inheritance).

10. Write a Python program to construct the following pattern, using a nested loop

```
        *
       **
      ***
     ****
    *****
     ****
      ***
       **
        *
```

11. Read a file content and copy only the contents at odd lines into a new file.

12. Create a Turtle graphics window with specific size.

13. Write a Python program for Towers of Hanoi using recursion

14. Create a menu driven Python program with a dictionary for words and their meanings.

15. Devise a Python program to implement the HangmanGame.

LearningResources:

- **RecommendedTexts**

  1. Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem   solving Focus", Wiley India Edition, 2015.

  2. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition , Pearson Education, 2016.

- **ReferenceBooks**

  1. Mark Lutz, "Learning Python Powerful Object Oriented Programming", O"reilly Media 2018, 5th   Edition.

  2. Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1 st   Edition.

  3. John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course   Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410

  4. Michel Dawson, "Python Programming for Absolute Beginers" , Third Edition, Course Technology   Cengage Learning Publications, 2013, ISBN 978-1435455009

Webresources : Web resources from NDL Library, E-content from open-source libraries

Mapping with Programme Outcomes :

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	2	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	3	2	S

3 – Strong, 2 – Medium , 1 - Low

CourseCode: SEC5	DIGITAL COMPUTER FUNDAMENTALS		Credits: 2
LectureHours:(L) perweek: 2	TutorialHours: (T)perweek	LabPractice Hours: (P)perweek	Total:(L+T+P) perweek: 2
CourseCategory: Skill Enhancement Course	Year&Semester: II Year III Semester		AdmissionYear: 2023-2024
Pre-requisite			
Linksto otherCourses			

LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field)
- Itaimstotrainthestudenttothebasicconceptsof DigitalComputerFundamentals
- To impart the in-depth knowledge of logic gates, Boolean algebra,combinationalcircuitsandsequentialcircuits.

CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn)

CO1: Identify the logic gates and their functionality.

CO2: Perform number conversions from one system to another system

CO3: Understand the functions of combinational circuits

CO4: Perform number conversions.

CO5: Perform Counter design and learn its operations.

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)

Units	Contents	RequiredHours
I	NumberSystemsandCodes:NumberSystem– BaseConversion – BinaryCodes – Code Conversion. Digital Logic: Logic Gates – Truth Tables – UniversalGates.	6
II	Boolean Algebra: Laws and Theorems – SOP, POS Methods – Simplification ofBooleanFunctions–UsingTheorems,K-Map,Prime–ImplicantMethod–Binary Arithmetic: Binary Addition – Subtraction – Various Representations ofBinaryNumbers– ArithmeticBuildingBlocks–Adder–Subtractor.	6
III	Combinational Logic: Multiplexers – Demultiplexers – Decoders – Encoders – CodeConverters–ParityGeneratorsandCheckers.	6
IV	SequentialLogic:RS,JK,D,andTFlip-Flops– Master-Slave Flip-Flops.Registers:ShiftRegisters– TypesofShiftRegisters.	6

V	Counters: Asynchronous and Synchronous Counters - Ripple, Mod, Up-DownCounters– Ring Counters. Memory: Basic Terms and Ideas –Types of ROMs –TypesofRAMs.	**6**
ExtendedProfessionalComponent(isapartofinternalcomponent only,Notto be included in the ExternalExaminationquestion paper)	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminationsUPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/otherstobesolved(Tobe discussedduringtheTutorialhour)	
Skillsacquiredfrom the Course	Knowledge,ProblemSolving,Analyticalability,Professional Competency,ProfessionalCommunicationandTransferrable Skill	

LearningResources:

- **RecommendedTexts**
    1. V.RajaramanandT.Radhakrishnan,*Digital Computer Design*, Prentice HallofIndia,2001
    2. D.P.LeachandA.P.Malvino,*DigitalPrinciplesandApplications*–TMH–FifthEdition–2002.
    3. M.MorisMano,*DigitalLogicandComputerDesign*,PHI,2001.
    4. T.C.Bartee,*DigitalComputerFundamentals*,6th Edition,TataMcGrawHill,1991.

- **Webresources :** Web resources from NDL Library, E-content from open source

    libraries

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1
CO2	3	3	3	3	1
CO3	3	3	3	2	2
CO4	3	3	2	2	3
CO5	3	3	2	2	3

Strong – 3   Medium – 2   Low – 1

SEMESTER IV

CourseCode: CC7	CLOUD COMPUTING		Credits: 5
LectureHours:(L) perweek: 5	TutorialHours: (T)perweek	LabPractice Hours: (P)perweek	Total:(L+T+P) perweek: 5
CourseCategory: Core	Year&Semester: II Year IV Semester	AdmissionYear: 2023-2024	
Pre-requisite	Basic Knowledge in Cloud Computing		

LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field)

- To introduce the cloud computing foundation
- To understand the Cloud Computing Architecture
- To know about the cloud security and application

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)

Units	Contents	RequiredHours
I	**CloudComputingFoundation:**Introduction to Cloud Computing–Move to CloudComputing–TypesofCloud–Workingof Cloud Computing	15
II	**Cloud Computing Architecture:** Cloud Computing Technology–Cloud Architecture–CloudModelingandDesign-Virtualization:Foundation–Grid,CloudandVirtualization– Virtualization and Cloud Computing	15
III	**Data Storage and Cloud Computing:** Data Storage–Cloud Storage–Cloud Storagefrom LANs to WANs –Cloud Computing Services: Cloud Services –Cloud Computingat Work	15

IV	**Cloud Computing and Security:** Risks in Cloud Computing–Data Security in Cloud–Cloud Security Services –Cloud Computing Tools: Tools and Technologies for Cloud –CloudMashaps–ApacheHadoop –Cloud Tools	**15**
V	**Cloud Applications:** Moving Applications to the Cloud –Microsoft Cloud Services –GoogleCloud Applications –Amazon Cloud Services –Cloud Applications	**15**

LearningResources:

- **RecommendedTexts**
- A.Srinivasan and J.Suresh, "Cloud Computing –A Practical Approach for Learning andImplementation",PearsonIndia Publications2014
- **ReferenceBooks**
- RajkumarBuyya,JamesBroberg,Andrzej,"CloudComputing:PrinciplesandParadigms",WileyIndiaPublications2011.
- ArshdeepBahgaandVijayMadisetti,"CloudComputing–AHandsonApproach",UniversitiesPress (India)PvtLtd. 2014.

- **Webresources :** Web resources from NDL Library, E-content from open source libraries

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome
CO1	Identify the architecture, infrastructure and delivery models of cloud computing.
CO2	Design Cloud Services and Set a private cloud.
CO3	Analyze the virtualization and cloud computing concepts.
CO4	Understand the key dimensions and challenges of cloud computing.
CO5	Familiarize with open source cloud computing software and free/commercial cloud services.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1
CO2	3	3	2	3	2

CO3	3	2	2	3	2
CO4	3	3	2	2	1
CO5	3	3	2	2	2

Strong – 3   Medium – 2   Low – 1

CourseCode: CC8	**CLOUD COMPUTING -LAB**		**Credits: 5**
LectureHours:(L)	**TutorialHours: (T)perweek**	**LabPractice Hours: (P)perweek: 5**	**Total:(L+T+P) perweek: 5**
CourseCategory: Core	**Year&Semester: II Year & IV Semester**		**AdmissionYear: 2023-2024**
Pre-requisite	Basic Knowledge in Cloud Computing		
LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field) • To gain practical expertise in coding			
CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn) **CO1:** Apply the fundamental concept about cloud computing **CO2:** Analyze Various methods about cloud computing			
Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)			
List of Exercises:			**RequiredHours**

Section A

- Write a C program that contains a string (char pointer) with a value \Hello World".The program should XOR each character in this string with 0 and displays theresult.

- Write a C program that contains a string (char pointer) with a value\Hello World". Theprogramshould ANDorand XOReach characterin this stringwith 127 anddisplaytheresult

- Write a Java program to perform encryption and decryption using the following algorithms: a)CeaserCipherb) Substitution Cipher c) Hill Cipher

- WriteaJavaprogramto implementtheDESalgorithmlogic

- WriteaC/JAVAprogramtoimplementtheBlowFishal gorithmlogicWriteaC/JAVAprogramtoimplementth eRijndaelalgorithmlogic.

- UsingJavaCryptography,encrypt thetext "Hello world"usingBlowFish.CreateyourownkeyusingJav akeytool.

- WriteaJavaprogram toimplementRSAAlgoithm

- ImplementtheDiffie-HellmanKeyExchangemechanismusingHTMLandJ avaScript.Consider the end user as one of the parties (Alice) and the JavaScript application as other party(bob).

- Calculate the message digest of a text using the SHA-1 algorithm in JAVA.Calculatethemessagedigest ofatextusingtheSHA-1 algorithm inJAVA.

SectionB

- InstallVirtualbox/VMwareWorkstationwithdifferentf lavoursoflinuxorwindowsOSon top of windows7 or8.

- InstallaCcompilerinthevirtualmachinecreatedusingvi rtualboxandexecuteSimplePrograms

- InstallGoogleAppEngine.Createhelloworldappandot hersimplewebapplicationsusingpython/java.

- UseGAElaunchertolaunchthewebapplications.

- SimulateacloudscenariousingCloudSimandrunasche dulingalgorithmthatisnotpresentinCloud Sim.

- Find a procedure to transfer the files from one virtual machine to another virtual machine.Finda procedureto launchvirtual

75

| | machineusingtrystack(OnlineOpenstack DemoVersion)InstallHadoopsingle nodeclusterandrun simpleapplications likeword count. | |

LearningResources:

LearningResources:

- **RecommendedTexts**
- **ReferenceBooks**

  • A.SrinivasanandJ.Suresh,"CloudComputing–APracticalApproachforLearningandImplementation",PearsonIndiaPublications2014.

- **Webresources:** Web resources from NDL Library, E-content from open source libraries

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome
CO1	Identify the architecture, infrastructure and delivery models of cloud computing.
CO2	Design Cloud Services and Set a private cloud.
CO3	Analyze the virtualization and cloud computing concepts.
CO4	Understand the key dimensions and challenges of cloud computing.
CO5	Familiarize with open source cloud computing software and free/commercial cloud services.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1
CO2	3	3	2	3	2
CO3	3	2	2	3	2
CO4	3	3	2	2	1
CO5	3	3	2	2	2

Strong – 3   Medium – 2   Low – 1

CourseCode: SEC6	PHP Programming web application development Lab		Credits : 2
LectureHours:(L)	TutorialHours: (T)perweek	LabPractice Hours: (P)perweek :2	Total:(L+T+P) perweek 2
CourseCategory: Skill Enhancement Course	Year : II Semester: IV		AdmissionYear: 2023-2024
Pre-requisite	Basic knowledge of programming language.		
Linksto otherCourses	NIL		
LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field) The objective of this course is to teach the fundamentals of quantum information processing, including quantum computation, quantum cryptography, and quantum information theory.			
CourseOutcomes:(forstudents:Toknowwhattheyaregoingtolearn) **CO1 :**use PHP in-built functions and string functions. **CO2:** assessment of using files **CO3** : practice passing of parameters from HTML to PHP. **CO4** : audit the usage of COOKIES and SESSIONS. **CO5** : design web pages for personal and business applications.			
Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequiredforthe course)[Thisisdoneduring2Tutorialhours)			

Units	Contents	RequiredHours
I	1. Simple PHP programs using expressions and operators. 2. Programs to demonstrate the usage of control structures	**30**

	3. Programs using Looping structures 4. Programs using arrays 5. Programs using string functions 6. Simple and parameterized functions. 7. To process personal details using File 8. To design an student mark database using HTML Form and process using PHP 9. Programs using OOPS concepts 10. Program to design a web page using various form controls 11. Data validation in web pages. 12. Using cookies and session variables	
ExtendedProfessionalComponent(isapartofinternalcomponent only,Notto be included in the ExternalExaminationquestion paper)	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminationsUPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/otherstobesolved(TobediscussedduringtheTutorialhour)	
Skillsacquired from the Course	Knowledge,ProblemSolving,Analyticalability,ProfessionalCompetency,ProfessionalCommunicationandTransferrable Skill	

LearningResources:

- **ReferenceBooks**
  1. Paul Deitel, Harvey Deitel, & Abbey Deitel. (2018). Internet and World Wide Web – How to Program, 5 th Edition. India: Pearson India Education.
- **Webresources**
  1. https://www.w3schools.com/php/
  2. https://www.javatpoint.com/php-tutorial

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	3	1
CO3	3	3	3	2	2
CO4	3	3	2	3	1

CO5	3	3	3	2	3-

Strong – 3   Medium – 2   Low – 1

Course Code: SEC7	**DATAWAREHOUSINGANDDATA MINING**		**Credits: 2**
Lecture Hours:(L) **Per week : 2**	**Tutorial Hours:** **(T)per week**	**Lab Practice** **Hours: (P) per week**	**Total:(L+T+P)** **Per week: 2**
Course Category: Skill Enhancement Course	**Year & Semester: II Year IV Semester**		**Admission Year:** **2023-2024**
Pre-requisite	Basic knowledge on Data handlings		
LearningObjectives:(forteachers:whattheyhavetodointheclass/lab/field) To know the fundamental concepts of big data and analytics. To explore tools and practices for working with big data.			

Course Outcomes:(for students: To know what they are going to learn)

CO1: Work with big data tools and its analysis techniques.

CO2: Analyze data by utilizing clustering and classification algorithms.

CO3: Learn and apply different mining algorithms and recommendation systems for large Volumes of data.

CO4: Perform analytics on data streams.

CO5: Learn No SQL databases and management.

Recap:(notforexamination)Motivation/previouslecture/relevantportionsrequired for the course)[Thisisdoneduring2Tutorialhours)

Units	Contents	Required Hours
I	Introduction: Data mining application–data mining techniques–data mining case studiesthefutureofdatamining– dataminingsoftware.**Associationrulesmining:**Introduction-Basics-taskandaNaivealgorithm-Apriorialgorithm–improvetheefficiencyoftheApriorialgorithm–miningfrequentpatternwithoutcandidategeneration(FP-growth) –performance evaluationofalgorithms.	6
II	Data warehousing: Introduction – Operational data sources- data warehousing – DataWarehousingdesign– Guidelinesfordatawarehousingimplementation-Datawarehousing - Metadata. Online analytical processing (OLAP): Introduction – OLAPcharacteristics of OLAP system – Multidimensional view and data cube - Data cubeimplementation – Data CubeoperationsOLAP implementation guidelines.	6
III	Classification: Introduction–decision tree–over fitting and pruning - DT rules–NaïveBayesmethod-estimationpredictiveaccuracyofclassificationmethods-otherevaluationcriteriafor classification method–classification software.	6
IV	Cluster analysis: cluster analysis – types of data – computing distances-types of clusteranalysismethods-partitionedmethods–hierarchicalmethods–densitybasedmethods– Dealing with large databases – quality and validity ofcluster analysis methods–clusteranalysissoftware.	6

V	Webdatamining:Introduction-webterminologyandcharacteristics-localityandhierarchy in the web- web content mining-web usage mining- web structure mining –web mining software. **Search engines:** Search engines functionality- search enginesarchitecture–Rankingofweb pages.	**6**

Learning Resources:

- **RecommendedTexts**

IntroductiontoDataminingwithcasestudies,G.K.Gupta,PHIPrivatelimited,NewDelhi, 2014.

  Unit I: Chapters 1 & 2
  Unit II: Chapters 7 & 8
  UnitIII:Chapter3
  UnitIV:Chapter4
  UnitV :Chapters 5&6

- **ReferenceBooks**

  - DataWarehousing,DataMining&OLAP,AlexBersonandStephenJ.Smith,TataMcGraw Hill Edition, Tenth Reprint2007

  - DataMiningConceptsandTechniques,JiaweiHanandMichelineKamber,SecondEdition, Elsevier,2007

  - InsightsintoDataMiningK.P.Soman,ShyamDiwakar,V.Ajay,TheoryandPractice,PHIPublications Eastern EconomyEdition 6th Printing, 2012

Web resources: Web resources from NDL Library, E-content from open-source libraries

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2
CO2	3	3	2	2	2
CO3	3	2	2	3	2
CO4	3	3	2	2	1
CO5	3	3	3	2	2

Strong – 3   Medium – 2   Low – 1