

Course Code	Title		
21U3CKC101 / 22U3CKC101	Core Paper I: Python Programming		
Semester: I	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(Common to B. Sc. IT / AIML / BCA)			
Course Objective	To develop algorithmic solutions to simple computational problems using Python		
Course Category	Employability		
Development Needs	Global		
Course Description	Python is a versatile programming language that can be used in a variety of fields, such as software development, government administration, business, science, arts, education, and others		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Python and write simple python program.	Lecture / Demonstration / Flipped Classroom	Assignment
CO 2	Develop Python programs with Control Statement and List method.	Demonstration / Constructivist Approach/ Tutorial	Seminar
CO 3	Apply Tuples, Functions and Set Iterators to develop simple applications	Lectures / Demonstration / Video Lessons	Quiz
CO 4	Apply Python Strings, Multithreading and Exceptions for problem solving.	Tutorial / Demonstration / Case Studies	Program Execution
CO 5	Manipulate Files and perform Event Handling.	Lecture / Demonstration / Class Projects	Program Execution
Offered by	Information Technology		
Course Content		Instructional Hours / Week : 4	
Unit	Description	Text Book	Chapters
I	Fundamentals of Python Programming: Introduction – Features – Applications – Installation-Sample Program-Python Virtual Machine-Memory management in Python-Comparison between C, Java and Python- Keywords, Identifiers, Statements, Indentation. Syntax and Styles: Data Types – Literals – Variables-Operators and Expressions-Evaluation of Expression-Sample Programs.	1	1,2
Instructional Hours			12
Suggested Learning Methods: Video lectures about the basics of Python Programming			02 Hrs
II	Control Flow: If – While – For – Break – Continue-Pass-Entry Controlled Loop - Exit Controlled Loop – Counter Controlled Loop - Condition Controlled Loop - Nested Loop - Sample Programs. Arrays-Sequences - Python Lists: Read a List type from a Keyboard-Accessing Elements of a List- Modifying Elements of a List – Basic Operations - Built-in Functions – Python List Methods.	1,2	3,4,5,9

		Instructional Hours	12										
		Suggested Learning Methods: Practice using Flow Charts	02 Hrs										
III	Tuples -Need of a Tuple-Sequence of Unpacking – Methods –Sample programs.Dictionary: Making a Dictionary-Basic Operations-Dictionary Operations – Sets-Iterators and Generators – Sample Programs. Functions: Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments-Default Arguments-Required Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions-Scope of Local and Global Variables.	1	6,7,8										
		Instructional Hours	12										
		Suggested Learning Methods: Develop small programmes using tuples	02 Hrs										
IV	Strings in Python: Reading – Accessing – Modifying – Finding - Iterating through a String - Build-in String Functions. Errors and Exceptions – Multithreading	2	8										
		Instructional Hours											
		Suggested Learning Methods: Develop small applications	02 Hrs										
V	Files and Directory Access: Files and Streams - Opening a File - Reading/Writing Operations in a File - Other operations in a File - Iterating through a File - Splitting Words - Serialization and Deserialization. Events: Event Objects - Binding callbacks to events - Event names - Keyboard events - Mouse Events - Sample Programs	1	13,17										
		Instructional Hours	12										
		Suggested Learning Methods: Laboratory practice	02 Hrs										
		Total Hours	60 Hrs										
Text Books	1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, Python Programming, University Press Pvt. Ltd.2018. 2. Dr.S.A.Kulkarni, Problem Solving and Python Programming, 2nd Edition, Yesdee Publishing,2018												
Reference Books	1. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers,2016 2. Guido van Rossum and Fred L. Drake Jr, An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd.,2011.												
Web. URLs													
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total							
8	8	10	8	8	8	50							
Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	-	-	M	H	H	M	M
CO2	M	M	M	M	H	M	-	-	H	H	H	M	H
CO3	H	L	M	H	M	M	-	-	M	H	H	M	M
CO4	M	H	L	M	L	L	-	-	H	M	H	H	M
CO5	M	M	H	H	M	H	-	-	H	H	M	H	H
H-High; M-Medium; L-Low													
Course designed by													
Verified by													

Course Code	Title		
21U3CJC102 / 22U3CJC102	Core Paper II: Data Structures		
Semester: I	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(Common to B. Sc. AIML / DS)			
Course Objective	To enable the students to understand about the various techniques such as Linked list, Searching and Sorting, apply them to solve complex programs.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	To understand the concept of Arrays, Stacks and Queues, Linked list, searching and sorting and apply to solve real world problem using appropriate Data Structure.		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the representation of Arrays, Stacks and Queues.	Lecture/ Demonstration	Quiz
CO 2	Solve the problems using Queues and List.	Lecture / Demonstration	Quiz
CO 3	Demonstrate different types of Tree representation and Graph.	Tutorial, Demonstration	Seminar
CO 4	Design Algorithm to perform different types of Sorting.	Problem-Based Teaching, Constructivist learning	Seminar
CO 5	Illustrate Symbol, hash and File organization and apply to solve real world problem using appropriate Data Structure.	Lecture / Demonstration	Assignment
Offered by	Artificial Intelligence and Machine Learning		
Course Content		Instructional Hours / Week: 4	
Unit	Description	Text Book	Chapters
I	Introduction: Overview - create Programs - Analyse Programs. Arrays: Axiomatization - Sparse Matrices - Representation of Arrays. Stacks & Queues: Fundamentals - Evaluation of Expressions - Multiple Stacks and Queues.	1	1,2,3
Instructional Hours			12
Suggested Learning Methods: Write Algorithms for Real time Scenario			3
II	Recursion: Recursive definition and process - recursion in C - Writing Recursive program - simulating Recursion - efficiency of recursion. Queues and List: The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure.	2	3,4
Instructional Hours			12
Suggested Learning Methods: Video Presentation			3
III	Trees: Binary Tree - Binary Tree representation - the Huffman algorithm - representing list as Binary - Trees and their applications - Game trees. Graphs: A Flow problem - The linked representation of Graph - Graph traversal and spanning forests	2	5,8
Instructional Hours			12

Suggested Learning Methods: Video Presentation			2										
IV	Internal Sorting: Insertion Sort - Quick Sort - 2-Way Merge Sort - Heap Sort - Shell Sort. External Sorting: Storage Devices - K-Way Merging. Sorting With Tapes: Balanced Merge Sorts - Polyphase Merge.	1	7,8										
Instructional Hours			12										
Suggested Learning Methods: Video Presentation			2										
V	Symbol Table: Static Tree Tables - Dynamic Tree Tables. Hash Tables: Hashing Functions- Overflow Handling. Files: Files, Queries and Sequential Organizations- Index Techniques - File Organization: Sequential Organization- Random Organization- Linked Organization.	1	9, 10										
Instructional Hours			12										
Suggested Learning Methods - Report Preparation			3										
Total Hours			60										
Text Books	<ol style="list-style-type: none"> 1. Ellis Horowitz & Sartaj Sahni, Fundamentals of Data Structures, Galgotia Publication. 2. Aaron M. Tenenbaum, Yediyah Langsam, Moshe J. Augenstein, Data Structure using C, Pearson Education, 2009. Unit I: Sections: 1.1 to 1.4, 2.1 to 2.4 and 3.1 to 3.4 (Text Book 1: Chapter 1, 2 and 3) Unit II: Sections: 3.1 to 3.4, 4.1 to 4.5 (Text Book 2: Chapter 3 and 4) Unit III: Sections: 5.1 to 5.6 (Text Book 2: Chapter 5) Unit IV: Section: 7.1 to 7.8, 8.1 to 8.3 (Text Book 1: Chapter 7 and 8) Unit V: Section: 9.1 to 9.3, 10.1, 10.3 (Text Book 1: Chapter 9 and 10)												
Reference Books	<ol style="list-style-type: none"> 1. Ellis Horowitz, Sartaj Sahni & Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Galgotia Publications Pvt Ltd, 1999. 2. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, Second Edition, Tata McGraw Hill, 2008. 3. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Florida International University, Pearson Education, Second Edition, 1997. 												
Web. URLs	https://www.programiz.com/dsa												
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total							
8	8	10	8	8	8	50							
Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H		M			M	M	M	M	M	M	M
CO2	M	M		M	M		M	H	M		H	M	H
CO3	H	H		M	M		M	H		M	H	M	M
CO4	H	H		M	M		M	H	H	H	M	M	H
CO5	H	M		M	M		M	H	M	M	M	H	M
H-High; M-Medium; L-Low													
Course designed by							Verified by						

Course Code	Title		
21U3AMP101 / 22U3AMP101	Core Paper III: Practical in Python Programming		
Semester: II	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To introduce the concepts of python programming constructs.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	To development skill set in python programming and apply the concepts to develop applications in order to meet the Local and Global needs.		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop simple Python programs.	Program Demonstration, Projects	Program Creativity
CO 2	Understand and apply the concept of control statements.	Program Demonstration	Debugging
CO 3	Apply the concept of looping constructs and functions for solving basic programs.	Laboratory Practice,	Application of Logic
CO 4	Develop programs for sorting of Strings, Lists, Tuples and File handler.	Constructivist learning, Code review	Program Development
CO 5	Create programs using Linear and Binary Search Techniques	Demonstration, Projects	Program Development
Offered by	Artificial Intelligence and Machine Learning		
Course Content		Instructional Hours / Week: 4	
Unit	List of Practical		
1	Write a python program that displays the following information: Your name, Full Address Mobile, number, College name, Course subjects.		
2	Write a python program to find the largest three integers using if-else and conditional operator.		
3	Write a python program that asks the user to enter a series of positive numbers (The user should enter a negative number to signal the end of the series) and the program should display the numbers in order and their sum.		
4	Write a python program to find the product of two matrices.		
5	Write recursive functions for GCD of two integers.		
6	Write recursive functions for the factorial of positive integer.		
7	Write recursive functions for Fibonacci Sequence up to given number n.		
8	Write recursive functions to display prime number from 2 to n.		
9	Write a python program that writes a series of random numbers to a file from 1 to n and display.		
10	Write a python program to sort a given sequence: String, List and Tuple.		
11	Write a python program to make a simple calculator.		

12	Write a python program for Linear Search and Binary Search.												
13	Write python program in which a function (with single string parameter) is defined and calling that function prints the string parameters given to function.												
14	Write python program in which a class is define, then create object of that class and call simple print function define in class.												
Total Hours												60	
Suggested Learning Methods: Solving Case studies, Program development, Code Review and Peer Coding												10	
Tools for Assessment (50 Marks)													
Application of Logic	e-Program Creativity	e- Program Debugging		Test 1		Test 2		Observation Note Book		Total			
8	8	8		10		10		6		50			
Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H		M	H		M	H	H	H	H	M	M
CO2	H	H		M	H		M	H	H	H	H	M	M
CO3	H	H		M	H		M	H	H	H	H	H	H
CO4	H	H		M	H		M	H	H	H	H	H	H
CO5	H	H		M	H		M	H	H	H	H	H	H
H-High; M-Medium; L-Low													
Course designed by							Verified by						

Course Code	Title		
22U3MKA101	Statistics for Computer Science		
Semester: I	Credits:4	CIA: 50 Marks	ESE: 50 Marks
(Common to all UG Programmes)			
Course Objective	To enable the students to learn and visualize the fundamental ideas of Statistical methods.		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Statistics play an intrinsic role in computer science and vice versa. Statistics is used for data mining, speech recognition, vision and image analysis, data compression, artificial intelligence, and network and traffic modelling		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Implement the basic concepts of measures of Central tendency and dispersion	Lecture / Peer Teaching	Assignment
CO 2	Understand the concepts of Correlation and Regression	Group learning/Lecture	Problem solving Skill
CO 3	Calculate probability using Baye's theorem	Lectures / Video Lecture	Seminar
CO 4	Know various techniques about random variables	Group Learning / Lecture	Assignment
CO 5	Analyse the properties of Binomial, Poisson and Normal.	Lecture /Tutorial	Quiz
Offered by	Mathematics		
Course Content		Instructional Hours / Week : 5	
Unit	Description	Text Book	Chapters
I	Statistics – Introduction–Measures of Central tendency- Arithmetic mean- Median - Mode Measures of dispersion – Range-Standard deviation –Quartile deviation- Coefficient of variation	2	7, 8
Instructional Hours			15
Suggested Learning Methods : Group Discussion & Quiz			02 Hrs
II	Correlation: Definition – Scatter diagram-Karl Pearson's correlation co-efficient-Rank correlation co-efficient –Properties. Regression: Introduction – Construction of regression equations – Properties.	2	10,11
Instructional Hours			15
Suggested Learning Methods : Problem solving Practice			02 Hrs
III	Probability: Introduction- Axioms of probability- Conditional probability- Addition theorem- Multiplication theorem- Independent event - Conditional probability -Total probability - Baye's theorem.	2	Vol. II- 1
Instructional Hours			15

Suggested Learning Methods : Class Test & https://youtu.be/CVvCvYFoCmM			02 Hrs										
IV	Random variables – Discrete random variables- Probability mass function- Continuous random variables – Probability density function	1	5										
	Mathematical Expectation – Properties and simple problems on PMF and PDF.	1	6										
Instructional Hours			15										
Suggested Learning Methods : Problem solving Practice			02 Hrs										
V	Discrete Probability Distributions-Binomial, Poisson, Normal - Simple Problems only.	2	Vol. II-2										
Instructional Hours			15										
Suggested Learning Methods : Practice Tests			02 Hrs										
Total Hours			75 Hrs										
Text Books	1. S.C. Gupta and V.K. Kapoor , Fundamentals of Mathematical Statistics , S. Chand and Sons, Reprint, 2009. 2. S P Gupta, Statistical methods , S. Chand and Sons, Reprint, 2017.												
Reference Books	1. P. R. Vittal , Mathematical Statistics , Margham Publications, Chennai												
Web. URLs	Web References (URLs): https://youtu.be/CVvCvYFoCmM												
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total							
8	8	10	8	8	8	50							
Mapping													
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	H	H	H	H	H	L	L	L	L	L
CO2	H	H	L	H	H	H	H	H	M	-	M	-	L
CO3	H	M	L	M	M	H	M	H	L	-	L	-	M
CO4	H	H	L	H	H	H	H	H	M	M	M	L	M
CO5	H	H	L	M	M	H	M	H	M	M	M	L	M
H-High; M-Medium; L-Low													
Course designed by							Verified by						

Course Code	Title		
22U3CKC203	Core Paper IV: Java Programming		
Semester: II	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(Common to B. Sc. CS / IT / AIML / BCA)			
Course Objective	To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	To understand the Object-Oriented Paradigm for developing programs using Control statements, Arrays, Packages, Interfaces, Exceptional Handling, Multi-threading and create networking applications		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamental concepts of Object-oriented Programming.	Lecture / Demonstration	Class Participation
CO 2	Develop simple Java programs with Control statements and arrays.	Demonstration, Constructivist learning	Quiz
CO 3	Apply the principles of packages and interfaces.	Constructivist learning Demonstration	Seminar
CO 4	Design Java application using the concepts of Exception Handling and Multithreading.	Lecture, Constructivist learning,	Seminar
CO 5	Develop applications using IO Streams and AWT.	Problem-based Teaching, Constructivist learning	Assignment
Offered by	Computer Science		
Course Content	Instructional Hours / Week: 4		
Unit	Description	Text Book	Chapters
I	Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine-Command Line Arguments.	1	1,2,3
Instructional Hours			12
Suggested Learning Methods: Code Debugging			3
II	Constants, Variables, Data Types, Operators and Expressions, Decision Making and Branching: if, if...else, nested if, switch,?: Operator, Decision Making and Looping: while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods. Arrays: One Dimensional Array-Creating an Array- Two Dimensional Array.	1	4,5,6,7 & 8
Instructional Hours			12
Suggested Learning Methods: Code Debugging			3
III	Interfaces: Multiple Interface -Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. Packages: Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-	1	10,11 & 12

	Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import.												
Instructional Hours				12									
Suggested Learning Methods: Simple Application Development				3									
IV	Exception Handling: Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. Multithreaded Programming: The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-Suspending, Resuming and Stopping Threads-JDBC.		2	10 & 11									
Instructional Hours				12									
Suggested Learning Methods: Simple Application Development				3									
V	Input/Output Classes: Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. Applets: Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. Java Networking -INetAddress-User Datagram Protocol, Internet Control Protocol, UDP Programming in Java Transmission Control Protocol, Multithreading & TCP Sockets Programming in Java.		2	16,18 & 19									
Instructional Hours				12									
Suggested Learning Methods: Simple Application Development				3									
Total Hours				60									
Text Books	<ol style="list-style-type: none"> 1. E. Balagurusamy, Programming with Java – A Primer, Tata McGraw Hill Publication, 3rd Edition, 2007 2. ISRD Group, Introduction to Object Oriented Programming Through Java, Tata McGraw Hill Publication, Forth Reprint 2008. 3. Java Network Programming, 4th Edition, Orielly Publication. 												
Reference Books	<ol style="list-style-type: none"> 1. Patrick Naughton& Hebert Schildt, The Complete Reference Java 2, Tata McGraw Hill Publication, 3rd Edition, 2002 2. John R. Hubbard, Programming with Java, Tata McGraw Hill Publication, 2nd Edition, 2009. 												
Web. URLs	https://www.w3schools.com/java/default.asp												
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total							
8	8	10	8	8	8	50							
Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H		M	H		M	H	H	H	H	M	M
CO2	H	H		M	H		M	H	H	H	H	M	M
CO3	H	H		M	H		M	H	H	H	H	H	H
CO4	H	H		M	H		M	H	H	H	H	H	H
CO5	H	H		M	H		M	H	H	H	H	H	H
H-High; M-Medium; L-Low													
Course designed by							Verified by						

Course Code	Title		
22U3AMC202	Core Paper V: Computer Networks		
Semester: II	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(Common to B. Sc. DCFS / AIML)			
Course Objective	To make the students understand the concepts of Computer Networks.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	To inculcate knowledge on Networking concepts and technologies like Wireless, Broadband and Bluetooth.		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Describe the uses of networks.	Smart Board / Demonstration	Assignment
CO 2	Illustrate the transmission technologies of networks	Smart Board / Demonstration	Seminar
CO 3	Analyse the services and the features of the various layers of data networks	Demonstration	Seminar
CO 4	Determine the network layer and understand how to control the congestion in the network.	Video Lessons	Group Discussion
CO 5	Apply the concept of presentation and network security.	Smart Board / Demonstration	Assignment
Offered by	Artificial Intelligence and Machine Learning		
Course Content	Instructional Hours / Week: 4		
Unit	Description	Text Book	Chapters
I	Introduction: The Uses of Computer Networks - Network Hardware - Network Software - Reference Model	1	1
Instructional Hours			12
Suggested Learning Methods: Report Presentation			2
II	The Physical Layer: Guided Transmission Media - Communication Satellites - The Public Switched Telephone Network - Structure of the telephone system - The Local Loops -S Modems - Wireless Local loops	1	3
Instructional Hours			12
Suggested Learning Methods: Report Presentation			2
III	The Data Link Layer: Data Link Layer Design Issues- Error Detection & Correction. The medium access control sub layer - The channel allocation problem. Bluetooth: Bluetooth architecture - Applications. Data Link Layer Switching: Repeaters, Hubs, Bridges, Switches, routers, and gateways	1	5
Instructional Hours			12
Suggested Learning Methods: Group Discussion			2
IV	The Network Layer: Network Layer Design issues - Routing algorithms - The Optimality principle shortest path routing – flooding - distance vector routing - routing for mobile hosts. The Transport layer: The transport services - service provided to the upper layers, transport service primitives.	1	7
Instructional Hours			12
Suggested Learning Methods: Group Discussion			2

V	The Presentation Layer: DNS - The Domain Name System - Electronic Mail. Architecture and service the user agent.						1	10					
	Network Security: Cryptography-Symmetric Key algorithms, DES - Public-key algorithms - Digital signature - symmetric key signature - public key signatures												
Instructional Hours							12						
Suggested Learning Methods: Video Presentation							2						
Total Hours							60						
Text Books		1. Andrew S Tenenbaum, Computer Networks , Pearson Education publication, 4 th Edition, 2012.											
Reference Books		1. Behrouz A. Forouzan, Sophia Chung Fegan, Data Communications and Networking , McGraw-Hill Higher Education, 3 rd Edition,2003. 2. V.S.Bagad, I.A.Dhotre, Data Communication & Networking , Technical Publication, 1 st Edition, 2010. 3. Achyut S Godbole ,AtulKahate, Computer Communication Networks , Tata McGraw Hill, 4 th Edition, 2006. FS											
Web. URLs		https://www.javatpoint.com/computer-network-tutorial											
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Group Discussion	Assignment	Seminar	Total							
8	8	10	8	8	8	50							
Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	-	M	M	-	-	M	H	M	M	H	H
CO2	M	M	-	M	M	-	-	M	H	M	M	H	H
CO3	M	H	-	-	M	-	M	H	M	-	H	-	M
CO4	H	H	-	M	M	-	M	H	H	H	M	H	H
CO5	H	M	-	-	M	-	M	H	M	M	H	M	M
H-High; M-Medium; L-Low													
Course designed by							Verified by						

Course Code	Title		
22U3AMP203	Core Paper VI: Practical in Java and Network Programming		
Semester: II	Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To enable the students to develop problem solving skills and programming ability in Java language.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	To make the students to understand the object-oriented paradigm, design technique, syntax.		
Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop programs to implement the string, array and multiple inheritance concepts.	Problem Based Teaching, Constructivist learning	Program Creativity
CO 2	Implement the multithreading, exception handling concepts to solve real world problems	Constructivist learning, Code Review	Debugging
CO 3	Apply the concept of package to illustrate reusability.	Constructivist learning	Application of Logic
CO 4	Create application for file handling.	Problem Based Teaching, Constructivist learning	Program Development
CO 5	Create Networking Applications using Java Network Programming concepts	Problem Based Teaching, Constructivist learning	Program Development
Offered by	Artificial Intelligence and Machine Learning		
Course Content	Instructional Hours / Week: 4		
Unit	List of Practical		
1	Write a Java Applications to extract a portion of a character string and print the extracted string.		
2	Write a Java program to insert an element (specific position) into an array.		
3	Write a Java Program to implement the concept of Interfaces.		
4	Write Java program to implement overloading of methods.		
5	Write a program to implement the concept of Exception Handling.		
6	Write java program to demonstrate runtime polymorphism using overriding.		
7	Write Java program to add two matrices.		
8	Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.		
9	Write a Java program to import classes from user defined package and creating package.		
10	Write a Java program to process text file.		
11	Write a Java Program to find the IP Address of the Machine		

12	Write a Java Program to implement TCP Protocol.													
13	Write a Java Program to illustrate the Local Loop in the network.													
14	Write a Java Program to implement UDP Protocol.													
15	Write a Java Program to implement Stop and Wait Protocol													
Suggested Learning Methods: Solving Case studies, Peer tutoring and pair programming												10		
Total Hours												60		
Tools for Assessment (50 Marks)														
Application of Logic	e-Program Creativity	e- Program Debugging					Test 1	Test 2	Observation Note Book	Total				
8	8	8					10	10	6	50				
Mapping														
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	M	M	-	M	M	-	-	H	M	H	H	M	M	
CO2	M	H	-	M	M	-	M	H	M	H	M	H	M	
CO3	M	H	-	M	M	-	-	H	H	M	M	M	H	
CO4	H	H	-	M	M	-	-	H	M	H	H	H	M	
CO5	H	H	-	M	M	-	-	H	H	M	H	M	H	
H-High; M-Medium; L-Low														
Course designed by							Verified by							

Course Code		Title		
22U3MIA202		Allied Paper II : Discrete Mathematics		
Semester: II		Credits: 4	CIA: 50 Marks	ESE: 50 Marks
(Common to B. Sc. CS / DS / IT / AIML / DCFS / BCA)				
Course Objective		To learn about the Discrete Structure for Computer Based Application.		
Course Category		Skill Development		
Development Needs		Regional		
Course Description		This course is to understand and use abstract discrete structures that are backbones of Computer Science. In particular, this course meant to introduce logic, proofs, sets, relations, functions, counting, and graph with an emphasis on applications in Computer Science.		
Course Outcomes		Teaching Methods	Assessment Methods	
CO 1	Learn the basic concepts of Set theory	Lectures / Peer Teaching	Assignment	
CO 2	Implement the basic ideas of Mathematical Logic in Computer Science	Lectures / Tutorial	Seminar	
CO 3	Classify different types of Relations and Functions	Lectures / Video Lectures	Assignment	
CO 4	Infer the concepts of Grammar and Automata theory.	Lectures / Tutorial	Work Sheet	
CO 5	Know the concepts of Graph theory	Lectures / Video Lectures	Quiz	
Offered by	Mathematics			
Course Content			Instructional Hours / Week : 5	
Unit	Description	Text Book	Chapters	
I	Set Theory: Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory. Fundamental products- Partitions of sets – Minsets- Algebra of sets and Duality-Inclusion and Exclusion Principle	1	1	
Instructional Hours			15	
Suggested Learning Methods: Problem Solving Practice			02 Hrs	
II	Mathematical Logic: Introduction- propositional calculus –Basic logical operations- Tautologies-Contradiction – Argument-PDNF & PCNF - Method of proof.	1	12	
Instructional Hours			15	
Suggested Learning Methods: Class Test			02 Hrs	
III	Relations: Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations. Functions – Types of functions – Invertible functions – Composition of functions.	1	3,4	
Instructional Hours			15	

Suggested Learning Methods: Assignments			02 Hrs										
IV	Languages: Operations on languages – Regular Expressions and regular languages.	1	15										
	Grammar: Types of grammars – Grammar Construction-Finite state machine –Finite State Automata- DFA- NDFFA- Conversion of NDFFA into DFA.												
Instructional Hours			15										
Suggested Learning Methods: Problem Solving Practice			02 Hrs										
V	Graph Theory: Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs.	1	9,10										
	Trees – Properties of trees – Binary trees-Traversal of Binary Trees.												
Instructional Hours			15										
Suggested Learning Methods: Problem Solving Practice			02 Hrs										
Total Hours			75 Hrs										
Text Books		1. J.K. Sharma, Discrete Mathematics , Macmillan India Ltd, 2nd edition, 2005.											
Reference Books		1. J. P. Tremblay, R. Manohar, Discrete Mathematics Structures with Applications to Computer Science , McGraw Hill International Edition, 2005. 2. T.Veerarajan, Discrete Mathematics with Graph Theory and Combinatorics , McGraw Hill International Edition, 2008											
Web. URLs		1. https://www.youtube.com/watch?v=oaOm2pnKkyY 2. https://youtu.be/tyDKR4FG3Yw											
Tools for Assessment (50 Marks)													
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total							
8	8	10	8	8	8	50							
Mapping													
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO 4	PSO 5
CO1													
CO2													
CO3													
CO4													
CO5													
H-High; M-Medium; L-Low													
Course designed by				Verified by									