A.D.M. COLLEGE FOR WOMEN

(Autonomous)

Affiliated to Bharathidasan University

(Nationally Accredited with "A" Grade by NAAC – 3rd Cycle)

NAGAPATTINAM 611 001.

LOCAL/NATIONAL/REGIONAL/GLOBAL RELEVANCE

PG DEPARTMENT OF COMPUTER SCIENCE

Programme: B.Sc Computer Science **Year: 2021-2022**

Course Code	Title of the Course	Local/ Regional/ National / Global	Rationale	Course Outcomes	PSOs Addressed	Cognitive Level
XUA	C Programming	National & Regional	C is highly portable language i.e. code written in one machine can be moved to other which is very important and powerful feature.	• CO1: Understand the basic terminology of algorithm, flowchart and gain awareness used in computer programming.	PSO 1	U,R
				• Co2: Design programs involving the various concepts like decision structures, loops, functions of C language.	PSO 4	Ap

				• Co3: Demonstrate the single, multi-dimensional arrays, String functions and user defined functions.	PSO 2	U, An
				• CO4: Compare the structure and union of C and apply it to construct array of structures and structure function.	PSO 3	An
				• CO5: Understand the dynamics of memory by the use of pointers and pointers with functions.	PSO 4	U, An
XUD	Object Oriented Programming Using C++ with Data Structures	Global	Provides rich set of problems covering the basic algorithms as well as numerous computing problems demonstrating the applicability and importance of	• CO 1: Learn the basic concepts in Object-Oriented programming	PSO 1	R
				• CO 2: Develop programming skills by applying Object-Oriented programming	PSO 2	Ap
				• CO3:Discuss the functio overloading and Membe Functions	PSO 2	Ap

			various data structures and related algorithms.	• CO 4: Understand the concepts of Constructors and Inheritance	PSO 3	An
				• CO 5: An Ability to incorporate Exception Handling in Object-Oriented programs. Analyze File Input/ Output Streams	PSO 4	U
XUF	Database Systems	National	To create general purpose software system that facilitates the process of defining databases for various applications globally.	• CO1: Emphasize the need, role, importance and uses of databases in application development	PSO 1	C
				• CO2: Design E-R modelling for a given situation and provide the foundation for development of relational database structure.	PSO 4	Ap
				• CO3: Identify the advantages of the database approach over the file based data storage system.	PSO 2	An

				• CO4: Distinguish between different models of file organizing, storing and using of data and understand the relational model and relational algebra operations. • CO5: Normalize the relational tables applying normalization rules and apply PL/SQL procedural interfaces statement on relational tables as per requirements.	PSO 3	An
					PSO 4	An
XUGY	Database Systems Lab	Global	To create general purpose software system that facilitates the process of defining databases for	• CO1: Work with internet concepts • CO2: Be familiar with the functionality of each layer of OSI and TCP/IP reference model. • CO3: Build up a clear concern on the networking technologies	PSO 5	E, U
					PSO 2	U
					PSO 2	U

			various applications globally	• CO4: Understand the data communication system, components and the purpose of layered architecture. • CO 5: Understand the services of data link layer and protocols	PSO 1 PSO 5	An An
XUE1Y	Web Designing Lab	Global	To create their own web site and in today's IT field web designing plays a vital role.	• **CO1:**Develop skills in analyzing the usability of a web site. • **CO2:**Understand how to plan and conduct user research related to web usability. • **CO3:**Design, develop and host a user friendly website. • **CO4:**Know the usage of APIs. • **CO5:**Layout management in line with current trend.	PSO 1 & PSO 2 PSO 1 & PSO 2 PSO 5 PSO 2 PSO 2	R R E, U U U
XUIY	Java	Global	To develop for embedded	• CO1:Read and understand Java-	PSO 2	R,U

	Programming Lab		applications Running On multiple platforms.	based software code of medium-to-high complexity. Use standard and third party Java's API's when writing applications.		
				• CO2: Understand the basic principles of creating Java applications with graphical user interface (GUI).	PSO 2,6	R,U
				• CO3: Create rich user-interface applications using modern API.	PSO 2	U
				• CO 4: Understand the structure of the computational process, algorithms and complexity of computation.	PSO 3	Ap
				• CO 5: Understand the basic approaches to the design of software applications. Apply the above to design, implement, appropriately document and test a Java	PSO 4	U

				application of medium complexity, consisting of multiple classes		
XUS1Y	R Programming Lab	Regional	R is a scripting language for statistical data manipulation, statistical analysis, graphics representation and reporting	• CO1: Understand the fundamental syntax of R through demonstrations and writing R code	PSO 1	R, U
				• CO2: Apply concepts such as data types, iteration, control structures, functions, and boolean operators using R	PSO 1 & PSO 2	R
				• CO3: Able to import a variety of data formats into R using R Studio	PSO 1	R, U
				• CO4: Explore data-sets to perform appropriate statistical tests using R	PSO 2	U

				• CO5: Acquire skills to generate charts and graphs visualization using R	PSO 1 & PSO 2	An
XUE4	Python Programming	Regional	To build data visualizatio and data analysis using pytho language.	• CO1: Describe the basic built-in functions and syntax of Python programming.	PSO 1	R, U
				• CO2: Explain the mapping and file concept.	PSO 5	R, A
				• CO3: Explain the object oriented programming concept.	PSO 1	U
				• CO4: Illustrate the concepts of decision making and construct statements.	PSO 1	R, A
				• CO5: Illustrate the usage of database and regular expression	PSO 3	A
XUE3	Big Data and Analytics	Regional	Big data analytics is the often complex process of examining big data to uncover	• CO1:Demonstrate the working of row and column oriented data stores	PSO 4	U

			information -- such as hidden patterns, correlations, market trends and customer preferences -- that can help organizations make informed business decisions.	• CO2:Describe the Hadoc architecture and File system	PSO 2	A
				• CO3: Apply the Map Reduce Programming model for real-worldproblems	PSO 5	U
				• CO4:Distinguish NoSQL ○ databases from RDBMS	PSO 2	A
				• CO5: Define the big data, types of data and understand the need of bigdata analytics	PSO 3	R, U
XUE4	Artificial Intelligence	Global	Artificial intelligence (AI) is the basis for mimickin human intelligence processe through the creation and application of algorithm built into a dynamic computin environment. Stated simply, A is trying to make computer think and act like humans.	• CO1:To understand the basics of Artificial Intelligence, Intelligent Agents and its structure	PSO 4	U
				• CO 2: To understand the problem solving by various searching techniques	PSO 2	A
				• CO3: To understand the concept of informed search	PSO 5	U

				and Exploration, constraint satisfaction		
				• CO4:Problems and Adversarial Search	PSO 2	A
				• CO 5: To Understand what is Reasoning and Knowledge Representation	PSO 3	R, U
XUNY	Python and Bioinformatics Lab	National, Regional. Global	Python is a widely used general-purpose, high-level programming language in bioinformatics field. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C++ or Java	• CO 1: On completion of the Course, the learner will be able	PSO 4	U
				• CO2: Practice the Python programming language from its scratch: its syntax, idioms, patterns and styles.	PSO 2	A
				• CO3: Illustrate the essentials of the Python library, and learn how to learn about other parts of the library when you need them.	PSO 5	U
				• CO4:Interpret the mathematical results in physical and other forms.	PSO 2	A

				• CO 5: Identify, formulate and solve the Linear Differential Equations.	PSO 3	R, U
XUJ	Web Technology	National, Regional	Web Technology refers to the various tools and techniques that are utilized in the process of communication between different types of devices over the internet.	• CO 1: Illustrate the web technology concept to create schemas and dynamic web pages.	PSO 4	U
				• CO 2: Understand the concept of CSS for dynamic presentation effect in HTML and XML documents.	PSO 2	A
				• CO 3: Describe the mark-up languages for processing, identifying and presenting information in web pages.	PSO 5	U
				• CO 4: Apply scripting languages in HTML document to add interactive components to web pages	PSO 2	A
				• CO 5: Define the knowledge	PSO 3	R, U

				about HTML document with element types, hyperlinks, images, list, tables and forms		
XUE4	Computer Graphics	Local, National,	To create the illusion of movement, by computer professionals.	• CO 1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics.	PSO 4	U
				• CO 2:Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.	PSO 2	A
				• CO 3:Use of geometric transformations on graphics objects and their application in composite form.	PSO 5	U
				• CO 4: Extract scene with different clipping methods and its transformation to graphics display device.	PSO 2	A

				• CO 5: Understands light interaction with 3D scenes	PSO 3	R, U
XUS2	Web Technology and Bioinformatics Lab	Regional, Global	Bioinformatics combines computer programming, big data, and biology to help scientists understand and identify patterns in biological data. It is particularly useful in studying genomes and DNA sequencing, as it allows scientists to organize large amounts of data.	• CO1: Identify the operators to learn the basic HTML commands	PSO 4	U
				• CO 2: Understand the concept of Hyperlinks, Use of Cascading Style sheets.	PSO 2	A
				• CO 3: Implement HTML concept in developing simple applications	PSO 5	U
				• CO 4: Implementing the techniques for DNA Transcription and Mutation.	PSO 2	A
				• CO 5: Analyze a web page and identify its elements and attributes	PSO 3	R, U

XUE5Y	UI/UX Design and Animation Lab using Open Source Tools	National	A good UI/UX design means more user engagement, more user engagement turns into potential leads, ultimately increasing the revenue, as well as the brand awareness of your business.	• CO 1: Understand the Usability of Interactive systems.	PSO 4	U
				• CO 2: Understand Principles	PSO 2	A
				• CO 3: Be able to manage	PSO 5	U
				• CO4: Be able to manage the development process	PSO 2	A
				• CO5: Interaction styles.	PSO 3	R, U

XUS2	Software Testing Tools Lab	Regional	Software testing tools are applications that can be used to assist developers and testers in performing manual or automated tests. Various tools perform specific functions such as unit testing, integration testing, regression testing, end-to-end testing, performance testing, compliance testing, and security testing	• CO 1: Apply modern software testing processes in relation to software development and Project management.	PSO 5	U
				• CO 2: Project management.	PSO 2	A
				• CO 3: Create test strategies and plans, design test cases	PSO 3	R, U
				• CO 4: Prioritize and Execute	PSO 4	U
				• CO5: Manage incidents and risks within a project.		

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PGXA	Database and No SQL	Regional & Global	NoSQL database provides much more flexibility when it comes to handling data. There is no requirement to specify the schema to working with the application. Also, the database doesn't put a restriction on the	• CO1: Define, compare and use the four types of No SQL Databases (Document-oriented, Key Value Pairs, Column-oriented and Graph).	PSO1	R,U
				• CO2: Distinguish the different types of No SQL databases.	PSO2	R
				• CO3: Explain the detailed architecture, define objects, load data, query data and	PSO2,4	U, An

			types of data you can together.	performance tune Document-oriented NoSQL databases.		
				• CO4: Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented No SQL databases.	PSO2,4	An
				• CO5: Evaluate NoSQL database development tools and programming languages.	PSO3,4	An
PGXB	Design and Analysis of Algorithms	National	To formulate new solutions for programming problems or improve existing code using algorithms	• CO1: Able to analyze different scenarios for running time of algorithms using asymptotic notations and Design using Recursion.	PSO2	R,U
				• CO2: Able to apply divide and conquer strategy for design of various algorithms	PSO1	U,A
				• CO3: Able to develop algorithms for well known	PS01	U

				problems using greedy methods.		
				• CO4: Able to understand the concept of backtracking for traversal and search algorithms.	PSO4	U,A
				• CO5: Able to describe and apply dynamic-programming approach for designing graph and matrix based algorithms.	PSO5	An
PGXC	Modern Operating Systems	Local & National	To meet the requirements of appearing National Eligible Test(NET)and SET	• CO1: To understand the main components of an OS & their functions.	PSO1	R,U
				• CO2: To study the process management and scheduling.	PSO4	R
				• CO3: To understand various issues in Inter Process Communication (IPC)and the role of OS in IPC.	PSO2	C

				• CO4: To understand the concepts and implementation Memory management policies and virtual memory.	PSO4	C
				• CO5: To study the need for special purpose operating system with the advent of new emerging technologies.	PSO1	An
PGXD	Advanced Java Programming	National & Regional	To develop general purpose application. It is used to develop web-based applications. It does not deal with database, socket programming, etc. It deals with socket programming, DOM,	• CO1: Understand the • Fundamental concepts of the • J2EE Technologies	PSO1	R,U
				• CO2: Comprehend the principles of J2EE programming.	PSO4	R
				• CO3: Learn the communication of client and server in the programming paradigm.	PSO2	C

			and networking applications.	• CO4: Understand the concept of JSP and EJB	PSO4	C
				• CO5: Ability to connect Spring with XML	PSO1	An
PGXEY	MongoDB Lab	National, Regional & Global	Mongo DB is an open source No SQL database management program. No SQL is used as an alternative to traditional relational databases.	• CO1: Configure persistence with Mongodb	PSO4	R
				• CO2: Connect to Mongodb	PSO1	R,U
				• CO3: Create our Collections	PSO4	R
				• CO4: Create relations between documents	PSO1	R,U
				• CO5: Use Query in Mongodb	PSO2	C
PGXFY	Advanced Java Programming Lab	Local & National	Advanced Java is everything that goes beyond Core Java – most importantly the	• CO1: Demonstrate programming language concepts RMI, Servlet	PSO1	U,A

			APIs defined in Java Enterprise Edition, includes Servlet programming, Web Services, the Persistence API, etc. It is a Web & Enterprise application development platform which basically follows client & server architecture.	• CO2: Demonstrate the behavior of JSP and Cookies	PSO2	C
				• CO3: Implement JSP connection with JDBC	PSO4	C
				• CO4: Develop programming aspect with spring based forms.	PSO1	U,A
				• CO5: Apply the concept of JSP using web views	PSO2	C
PGXE1	Artificial Intelligence	National, Regional & Global	Artificial intelligence (AI) is the basis for mimicking human intelligence processes through the creation and application of	• CO1: To understand the basics of Artificial Intelligence , Intelligent Agents and its structure	PSO4	R
				• CO2 To understand the problem solving by various searching techniques	PSO1	R

			algorithms built into a dynamic computing environment.	• CO3: To understand the concept of informed search and Exploration	PSO2	C
				• CO4: To understand the concept of constraint satisfaction Problems and Adversarial Search	PSO1	C
				• CO5: To understand the concept of Reasoning with Uncertainty & Probabilistic Reasoning	PSO2	C
PGXE1	High Performance Computing	Local & National	HPC helps engineers, data scientists, designers, and other researchers solve large, complex problems in far less time and at less cost than traditional	• CO1: To understand fundamental concepts and techniques in parallel computation structuring and design.	PSO4	R
				• CO2: To Study various architectures of high - performance computing systems	PSO1	C

			computing. The primary benefits of HPC are: Reduced physical testing: HPC can be used to create simulations, eliminating the need for physical tests.	• CO3: To demonstrate the principles of Parallel Algorithm Design.	PSO4	R
				• CO4: Investigate modern design structures of pipelined and multiprocessors systems.	PSO1	An
				• CO5: Understand the algorithms using parallel programming principle and to study about Parallel sparse matrix and vector multiplication	PSO4	R
PGXE1	Parallel and Distributed Computing	Local, National	Parallel computing helps to increase the performance of the system. In contrast, distributed computing allows scalability, sharing resources and helps to perform	• CO1: Develop and apply knowledge of parallel and distributed computing techniques and methodologies.	PSO2	C
				• CO2: Apply design, development, and performance analysis of	PSO4	R

			computation tasks efficiently.	parallel and distributed applications.		
				• CO3: Use the application of fundamental Computer Science methods and algorithms in thedevelopment of parallel applications.	PSO2	C
				• CO4: Explain the design, testing, and performance analysis of a software system	PSO1	R,U
				• CO5: Able tocommunicate that design to others.	PSO3	U, An
PGXG	Data Science Using Python	Regional & Global	Widely used among data scientists. It is one of the easiest languages to learn and has impressive libraries and works perfectly for every stage of data science	• CO1: Understanding the basic concepts of Python	PSO1	R,U
				• CO2:Preparing and pre-processing data	PSO2	An
				• CO3: Visualizing the results of analytics effectively	PSO3	U, An

				• CO4:Basic understanding of NumPy and Pandas	PSO4	C,U
				• CO5: Ability to use conditional loops and list by python	PSO3,4	An
PGXH	Big Data Analytics	Global	PSO3	• CO1: Understanding the basic concepts of Big Data	PSO1	R,U
				• CO2: To discuss the challenges traditional data mining algorithms face when analyzing Big Data.	PSO1	R,U
				• CO3: To introduce the tools required to manage and analyze big data like Hadoop, NoSql Map Reduce.	PSO1	R,U
				• CO4: To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.	PSO1	R,U

				• CO5: To introduce to the students several types of big data like social media, web graphs and data streams.	PSO1	R,U
PGXI	Distributed Technologies	Global	To make easy for users to access and share remote resources	• CO1: Understand the features of Dot Net Framework along with the features of C#.	PSO1	R,U
				• CO2: Build well-formed XML Document and implement Web Service using Java.	PSO2	An
				• CO3: Students will identify the core concepts of distributed systems: the way in which several machines organize to correctly solve problems in an efficient, reliable and scalable way.	PSO2	An

				• CO4: Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.	PSO3	U
				• CO5: Apply Web Services concept in database	PSO4	An
PGXJY	Distributed Technologies Lab	National	Resources can be virtually anything, typical examples of resources are printers, storage facilities, data, files, web pages, and networks.	• CO1: Use the features of Dot Net Framework along with the features of C#.	PSO1,PSO2	R,U
				• CO2: Create user interactive web pages using ASP.Net.	PSO2, PSO4	U,AN
				• CO3: Build well-formed XML Document and implement Web Service using Java.	PSO1,PSO2	R,U

				• CO4:Studentswillexaminehowexistingsystemshaveappliedtheconceptsofdistributedsystemsindesigninglargesystems,andwilladditionallyapplythesecconceptstodevelopsamplesystems	PSO2, PSO4	U,AN
				• CO5:Performing Database operations for various web applications.	PSO1,PSO2	R,U
PGXKY	Advanced Python Lab	National, Regional & Global	Used in the scientific and research communities is because of its ease of use and simple syntax which makes it easy to adapt for people who do not have an engineering background.	• CO1:Design forms using various functions	PSO1,PSO2	R,U
				• CO2:Apply rich controls and conditional statement logic in Python	PSO2, PSO4	U,AN
				• CO3:Demonstrate the functionality of stack and regular expressions through	PSO1,PSO2	R,U

				Python		
				• CO4:Ability to Create indexing scripts using Pandas	PSO4	R,U
				• CO5:Build applications using Pandas	PSO1,PSO2	R,U
PGXL **(SPL)**	Virtualization & Cloud Computing	Global	To enhance the effectiveness of various businesses using cloud storage globally	• CO1:Possess knowledge on Cloud Computing and its architecture	PSO1, PSO2	R,U
				• CO2: Acquire knowledge on Virtualization techniques	PSO2, PSO4	U,AN
				• CO3:Understand cloud infrastructure services	PSO1, PSO2	R,U
				• CO4: Identify the parallel and distributed programming	PSO1, PSO2	R,U

				paradigms		
				• CO5: Handle various cloud computing tools to learn the Cloud security and security challenges	PSO1, PSO2	R,U
PGXE2	Ethical Hacking	Regional & Global	To prevent sensitive data from falling into enemy hands in global level.	• CO1 Use new career opportunities available in IT profession, audits and others with special skills such as energy efficiency,	PSO2	U
				• CO2: ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services.	PSO1	R,U
				• CO3: Introduces the concepts of Ethical Hacking	PSO1	An
				• CO4: Gives the students the opportunity to	PSO2	U

				learn about different tools and techniques in Ethical hacking and security		
				• CO5: Practically apply Ethical hacking tools to perform various activities	PSO2	An
PGXE2	Cryptography & Network Security	Local & National	To ensure that what is received is genuine and from the intended sender, the receiver is assured that the data received has not been tampered with during transmission.	• CO1: Explain the basics of number theory and compare various encryption techniques	PSO2	An
				• CO2: Understand the manner in which message Authentication code and hash function work andthe functionality of public key cryptography.	PSO2	U
				• CO3:. Familiarize in intrusion detection and firewall design	PSO1	An
				• CO4: Examine the different types of security systems and	PSO2	An

				applications.		
				• CO5: Discuss different levels of security and services and recognize various security policies	PSO1	U
PGXE2	Ad hoc and Sensor Networks	Local & National	Ad hoc networks can be very helpful during meetings or in any location where a network doesn't exist and where people need to share files. An ad hoc network can also be useful in situations where only one PC has Internet access and that access needs to be shared.	• CO1: To understand the basics of AdHoc & Sensor Networks.	PSO1	R,U
				• CO2: To learn various fundamental and emerging protocols of all layers in AdHoc Network.	PSO1	An
				• CO3: To study about the issues pertaining to major obstacles in establishment and efficientmanagement of AdHoc and Sensor Networks.	PSO2	R,U

				• CO4: To understand the nature and applications of AdHoc and Sensor Networks.	PSO1	An
				• CO5: To understand various security practices and protocols of AdHoc and Sensor Networks	PSO2	R,U
PGXE3	Compiler Design	National	To meet the requirements of appearing National Eligible Test (NET)	• CO1: Able to identify and understand different phases and passes of compiler and theirfunctioning	PSO1	An
				• CO2: Able to understand the concept of syntax analysis and to solve the problems of predictiveparsing.	PSO2	U
				• CO3:. Able to differentiate between top down and bottom up parsing and understand syntaxdirected translation techniques.	PSO1	An

				• CO4: Able to apply code optimization and code generation techniques.	PSO1	U
				• CO5: To learn & use the new tools and technologies used for designing a compiler	PSO2	U
PGXE3	MANET	Local & National	Solution of routing optimization with an effective and efficient approach to energy consumption in the global MANET-IOT system is presented as main result of this work, which can help in accessibility and provision of services for a longer	• CO1: Appraise the importance of Adhoc networks such as MANET and VANET and Wireless Sensor networks	PSO1	R,U
				• CO2:Understand design considerations for wireless networks	PSO2	R,U
				• CO3: Explain the design considerations for deploying the wireless network infrastructure.	PSO2	An
				• CO4: Compare the differences between cellular and ad hoc	PSO2	U

			period of time over global Future Internet infrastructure.	networks and the analyse the challenges at various layers and applications		
				• CO5: Summarize the protocols used at the MAC layer and scheduling mechanisms.	PSO2	R,U
PGXE3	Software Project Management	National, Regional	Project management software is useful because it helps you keep track of tasks and see them against the backdrop of the entire project.	• CO1: Identify the different project contexts and suggest an appropriate management strategy.	PSO2	R,U
				• CO2: Practice the role of professional ethics in successful software development.	PSO2	R,U
				• CO3: Identify and describe the key phases of project management.	PSO1	An
				• CO4:Determine an appropriate project management approach through an evaluation	PSO2	R,U

				• CO5:Business context and scope of the project	PSO2	R,U
PGXM	Data Mining and Data Warehousing	Global	To create general purpose software system that facilitates the process of defining databases for various applications globally	• CO1: To introduce the concept to f data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage.	PSO2	U,AP
				• CO2: To enable students to effectively identify sources of data and process it for data mining	PSO2	U,AP
				• CO3: To impart knowledge of tools used for data mining	PSO2	U,AP
				• CO4: To provide knowledge on how to gather and analyze large sets of data to gain useful business	PSO3	U,AP

				understanding.		
				• CO5: To make students well versed in all data mining algorithms, methods of evaluation.	PSO1	U,AP
PGXN	Data Mining Lab	Global	To analyze and synthesize the data with trouble shooting and fault tolerance globally.	• CO1:Perform exploratory analysis of the data to be used for mining.	PSO2	U,AP
				• CO2: Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.	PSO2,6	U,AP
				• CO3: Define and apply metrics to measure the performance of various data mining algorithms.	PSO2	U,AP
				• CO4: Develop skills and apply data mining tools for solving practical problems	PSO3	U, An

				• CO5: Advance relevant programming skills and gain experience and develop research skills by reading the data mining literature.	PSO4	U,AP
PGXO	Machine Learning and R Programming	National, Regional & Global	R is powerful because of the breadth of techniques it offers. Any techniques that you can think of for data analysis, visualization, sampling, supervised learning and model evaluation are provided in R.	• CO1: Statistical Learning: Understand the behavior of data as you build significant models	PSO1	R,U
				• CO2: R for Machine Learning: Learn about the various libraries offered by R to manipulate, preprocess and ○ Visualize data	PSO2	R
				• CO3:Optimization Techniques: Learn to use optimization techniques to find them in immune error in your machine learning model	PSO2	U, An
				• CO4: Fundamentals of		

				Machine Learning: Supervised, Un supervised Machine Learning and relation of statistical modeling to machine learning	PSO4	R
				• CO5: Machine Learning Algorithms: Learn various machine learning algorithms like KNN, Decision Trees, SVM, Clustering in detail	PSO3,4	An
PGXPY	Embedded Lab	National & Regional	An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a	• CO1: Experience with as set of tools for embedded systems programming and debugging.	PSO1	U
				• CO2: Experience with implementing several embedded systems with particular focus on the interaction between multiple	PSO3	An

			particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system	devices.		
				• CO3: Design products using microcontrollers and various analog and digital ICs.	PSO1	U
				• CO4: Can read the data sheet for any embedded system, understand how it works.	PSO4	An
				• CO5:Develop existing embedded systems by formulating the system design problem including the design constraints, create a design that satisfies the constraints, implement the design in hardware and software	PSO1	U, An
PGXE4	Embedded System	Local & National	Embedded systems are to control a specific function within a	• CO1: Learn fundamentals of designing embedded systems.	PSO2	U,AP
				• CO2: Different design		

			device. They are usually designed to only perform this function repeatedly, but more developed embedded systems can control entire operating systems.	platforms used for an embedded systems application.	PSO2,6	U,AP
				• CO3: Explain the embedded system concepts and architecture of embedded systems.	PSO2	U,AP
				• CO4: The concepts and architecture of embedded systems.	PSO3	U, Ap
				• CO5: Analyze a given embedded system design and identify its performance critical points.	PSO4	U,AP
PGXE4	Security in Computing	Local & National	It is the protection of computer systems and information from harm, theft, and unauthorized use.	• CO1: Identify some of the factors driving the need for network security	PSO2	U,AP
				• CO2:Identify and classify		

			Computer hardware is typically protected by the same means used to protect other valuable or sensitive equipment—namely, serial numbers, doors and locks, and alarms.	particular examples of attacks	PSO2,6	U,AP
				• CO3: Define the terms vulnerability, threat and attack	PSO2	U,AP
				• CO4: Identify physical points of vulner ability in simple networks	PSO3	U, An
				• CO5: Compare and contrast symmetric and asymmetric encryption systems and their vulner ability to attack, and explain the characteristics of hybrid systems.	PSO4	U,AP
PGXE5	Internet of Things	National, Regional & Global	The number of connected IOT devices is increased in use worldwide for application development	• CO1: Understand the Architectural Overview of IOT.	PSO2	An
				• CO2: Realize the concepts of IOT using Wireless Technologies.	PSO2,6	U

			services and software more than cost control or productivity.	• CO3: Understand the various IOT Protocols.	PSO2	An
				• CO4: Impart the knowledge on the devices of IOT.	PSO3	U, An
				• CO5: Comprehend the idea of M2M.	PSO4	U,AP
PGXE5	Human Computer Interaction	Regional	To identify areas of improvement and then create better services and products	• CO1: To stress the importance of good interface design	PSO2	U,AP
				• CO2: To predict good features of interface designs.	PSO2,6	U,AP
				• CO3: To evaluate designs based on theoretical frameworks and methodological approaches.	PSO2	U,AP
				• CO4: To identify and criticize bad features of interface designs.	PSO3	U
				• CO5: To learn the techniques for prototyping and evaluating user experiences.	PSO4	U,AP

PGXE5	Web Services	Local & National	A web service is a unit of managed code that can be remotely invoked using HTTP. That is, it can be activated using HTTP requests. Web services allow you to expose the functionality of your existing code over the network.	• CO1: Understand the principles of SOA	PSO2	U,AP
				• CO2: Efficiently use market leading environment tools to create and consume web services	PSO2,6	U,AP
				• CO3: Identify and select the appropriate framework components in creation of web service solution	PSO2	U,AP
				• CO4: Apply OOP principles to creation of web service solutions	PSO3	U, An
				• CO5: Understand to format XML data to the desired format	PSO4	U,AP