# PARK'S COLLEGE (AUTONOMOUS), TIRUPUR

## B.Sc ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

## VISION

- Attain global excellence in the field of education and training and produce professionals of world standards to face the competitive tomorrow. Accept and adhere to the latest emerging technologies without crossing the boundaries of our rich culture.

## MISSION

- Create human assets with high ethics who would considerably contribute for the betterment of the nation.
- Provide a curriculum that better matches the requirements of the individual, industry and the society.
- Keep quality education affordable and reachable to all segments and sections of the society.
- Welcome technological developments in full swing and implement the best of them constantly.

## Programme Educational Objectives (PEO)

Under Graduate of B.Sc Artificial Intelligence & Machine Learning program will be

**PEO1:** Make use of strong technical aptitude and domain knowledge to build up smart software solutions for the development of society.

**PEO2:** Utilizing research and entrepreneurial altitude enhanced with a rich set of communication, teamwork and leadership skills to outshine in their profession.

**PEO3:** Exhibiting permanent improvement in their profession through continuous learning, oblige human values and ethics.

# PROGRAMME OUTCOMES (PO)

## B.SC. (Artificial Intelligence & Machine Learning Programme)

On completion of B.Sc Artificial Intelligence & Machine Learning programme, the students are expected to

**PO1:** Apply the knowledge of mathematics, science, and computing to the solution of complex scientific problems.

**PO2:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and applied sciences.

**PO3:** Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5:** Create, select, and apply appropriate techniques, resources, and modern computing and IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.

**PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.

**PO7:** Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.

**PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10:** Communicate effectively on complex activities with the scientific community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11:** Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# COURSE OUTCOMES

| Course Code and Course Name | Course Outcomes |
|---|---|
| **LANGUAGE-I** | **CO1**: புதுக்கவிதை, மரபுக்கவிதை வாயிலாக இலக்கிய, வாழ்வியல் அறநெறிகளை உரைத்தல்.<br>**CO2**: சிறுகதை வழி வெளிப்படும் சமுதாயச் சிந்தனைகளை அறிந்து விழிப்புணர்வைப் பெறுதல்.<br>**CO3**: தன்னம்பிக்கையை ஏற்படுத்தல்.<br>**CO4**: மாணவர்களுக்கு மொழி அறிவை வளர்த்தல்.<br>**CO5**: இலக்கியங்கள் தோன்றி வளர்ந்த பின்புலத்தையறிதல். |
| **E01**<br>**ENGLISH-I** | **CO1:** To identify English as an easy language for the purpose of learning<br>**CO2:** To acquire language skills with literary appreciation and critical thinking<br>**CO3:** To construct a sentence competitively in the spoken and written communication<br>**CO4:** To develop a passion for Literature and language<br>**CO5:** To develop the different usage of sentences and modes of letter writing |
| **21AGC1**<br>**PROGRAMMING IN C** | **CO1 :** Understand the basic terminology used in C programming.<br>**CO2 :** Write, compile and debug programs in C language.<br>**CO3 :** Design programs involving decision structures, loops and functions.<br>**CO4 :** Understand the dynamics of memory by the use of pointers.<br>**CO5 :** Understand the concept of files in C language. |
| **21AGC2**<br>**DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION** | **CO1 :** Acquire knowledge about Number System and Binary Codes, Complements, BCD, Excess3, Gray Code<br>**CO2 :** Knowledge on Logic Circuits, Half adder, Full adder<br>**CO3 :** Acquire knowledge about Register and Counter<br>**CO4 :** Knowledge on Priority Interrupt Asynchronous data transfer<br>**CO5 :** .Acquire knowledge Memory Organization |
| **21AAL1**<br>**MATHEMATICAL STRUCTURE FOR COMPUTER SCIENCE** | **CO1 :** Understand the basic concept Matrix.<br>**CO2 :** Know the concept of Numerical Algebra<br>**CO3** : Know about Simultaneous Linear Algebraic Equations<br>**CO4 :** Know about Interpolation and Newton's forward and Backward for equal intervals<br>**CO5 :** Understand the Numerical Differentiation |
| **21ACL1**<br>**PROGRAMMING IN C LAB** | **CO1 :** Understand the basic concept of C Programming.<br>**CO2 :** Acquire the knowledge about Operators, Control Statements & Looping.<br>**CO3 :** Understand the role of functions and files involving the idea of modularity.<br>**CO4 :** Understand the string operations in detail.<br>**CO5 :** Acquire the knowledge about the pointer concept. |

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|---|---|
| **FCA ENVIRONMENTAL STUDIES** | **CO1 :** Understand and gain a rigorous foundation in various scientific disciplines as they apply to environmental science, such as ecology, evolutionary biology, hydrology, and human behaviour.<br>**CO2 :** Understand the primary environmental problems and the science behind those problems and potential solutions.<br>**CO3 :** Acquire the knowledge about the social issues.<br>**CO4 :** Learn about the field work of the environmental issues.<br>**CO5 :** Acquire the knowledge about the pollution and its effects. |
| **SS1 COMMUNICATIVE ENGLISH** | **CO1 :** Develop and effectively communicate through verbal/oral communication and improve the listening skills.<br>**CO2 :** Develop and actively participate in group discussion / meetings / interviews and prepare & deliver presentations.<br>**CO3 :** Understand and develop effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, inter-personal relationships, conflict management and leadership quality.<br>**CO4 :** Understand the individual through goal/target setting, self motivation and practicing creative thinking.<br>**CO5 :** Enrich the personality. |
| **LANGUAGE-II** | **CO1 :** சிற்றிலக்கியம், காப்பியம் வாயிலாக இலக்கிய,வாழ்வியல் அறநெறிகளை உரைத்தல்.<br>**CO2 :** கட்டுரை வழி வெளிப்படும் சமுதாயச் சிந்தனைகளை அறிந்து விழிப்புணர்வைப் பெறுதல்.<br>**CO3 :** தன்னம்பிக்கையை வளர்த்தல்.<br>**CO4 :** இலக்கணங்களைக் கற்று தருதல், படைப்புத் திறனை உக்குவித்தல்.<br>**CO5 :** மாணவர்களை வேலை வாய்ப்புடன் கூடிய போட்டித் தேர்வுகளுக்குத்தயார்ப்படுத்துதல். |
| **E02 ENGLISH-II** | **CO1:** To read and comprehend English in the context of acquisition of soft (life) skill.<br>**CO2:** To acquire knowledge about three basic genres of literature namely poetry, prose and drama along with their subdivisions emergence in various ages.<br>**CO3:** To understanding of the various aspects of the Essay-its elements, kinds, structure and the nuances of language<br>**CO4:** To communicate clearly, effectively and handle their day to day affairs well with their knowledge of language skills.<br>**CO5:** To apply the basic grammatical rules learnt from the prescribed text. |
| **21AGC3 OBJECT ORIENTENTED** | **CO1 :** To understand the principles and practice of object oriented analysis<br>**CO2 :** Ability to implement basic concepts, compile, test and run Java programs comprising more than one class, to address a particular software problem |

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|---|---|
| **PROGRAMMING USING JAVA** | **CO3 :** Ability to make use of members of classes found in the Java API packages and interfaces<br>**CO4 :** Understand the concept of File handling in java<br>**CO5:** Demonstrate the ability to employ various types of selection constructs in a Java program. |
| **21AGC4 FUNDAMENTALS OF DATA STRUCTURES** | **CO1 :** Analyze performance of algorithms and choose the appropriate data structure and algorithm design method for a specified application<br>**CO2 :** Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs and Use various data structures effectively in application programs.<br>**CO3 :** Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.<br>**CO4 :** Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick sort.<br>**CO5 :** Gain knowledge about Hashing and Collisions and B- Trees |
| **21AAL2 PROBABILITY AND STATISTICS** | **CO1 :** Understand the basic concept of Probability and Conditional probability.<br>**CO2 :** Know the concept of random variables, expectations and moment generating functions.<br>**CO3 :** Know about some standard distributions.<br>**CO4 :** Know about correlation and regression.<br>**CO5 :** Understand the concept of testing of hypothesis |
| **21ACL2 OBJECT ORIENTENTED PROGRAMMING USING JAVA LAB** | **CO1 :** To understand the Principles of object oriented Programming<br>**CO2 :** Ability to implement to compile, test and run Java programs.<br>**CO3 :** Ability to make use of applet Programming<br>**CO4 :** Understand the concept of Thread handling in java<br>**CO5 :** Get Basic Knowledge on Menu creation in Applets |
| **FCB HUMAN RIGHTS , CONSTITUTION OF INDIA , INTELLECTUAL PROPERTY RIGHTS** | **CO1 :** Understand and apply written and oral communication skills to business.<br>**CO2 :** Understand and analyze the global legal environment.<br>**CO3 :** To familiarize the complex problems, find and deploy a variety of legal authorities, and communicate effectively in a variety of settings.<br>**CO4 :** Understand and Develop skills in business situations.<br>**CO5 :** Acquire the knowledge about the constitution of India. |
| **SS1 COMMUNICATIVE ENGLISH** | **CO1 :** Develop and effectively communicate through verbal/oral communication and improve the listening skills.<br>**CO2 :** Develop and actively participate in group discussion / meetings / interviews and prepare & deliver presentations.<br>**CO3 :** Understand and develop effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.<br>**CO4 :** Understand the individual through goal/target setting, self motivation and practicing creative thinking.<br>**CO5 :** Acquire the knowledge about the correct usage and conversation practice |

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|---|---|
| **LANGUAGE-III** | **CO1:** பக்தி இலக்கியம் வாயிலாக இலக்கிய, வாழ்வியல் அறநெறிகளை உரைத்தல்.<br>**CO2:** நீதி இலக்கியம் வாயிலாக வாழ்வியல் அறநெறிகளை உரைத்தல்.<br>**CO3:** நவீன கருவிகளை அறியச் செய்தல்.<br>**CO4:** இலக்கணங்களைக் கற்றுத் தருதல், படைப்புத் திறனைஊக்குவித்தல்.<br>**CO5:** தற்கால கவிஞர்களைப் பற்றியும், சங்க இலக்கியங்களைப் பற்றியும் அறியச் செய்தல். |
| **E03**<br>**ENGLISH-III** | **CO1:** To identify the concepts of basic Grammar.<br>**CO2:** To understand the proficiency of the English writer's narrative skill's of their experience.<br>**CO3:** To express their own notions, in prose, poetry and short story.<br>**CO4:** To develop an interest for literature and language<br>**CO5:** To distinguish the development of prose through different periods. |
| **21AGC5**<br>**RELATIONAL DATABASE MANAGEMENT SYSTEM** | **CO1 :** To analyze Data Base Management System design methodology.<br>**CO2 :** Acquire knowledge about data modelling using entity and relation.<br>**CO3 :** Design data base and normalize data and Understand how query are being processed and executed.<br>**CO4 :** Draw various data models for Data Base and Write queries mathematically and understanding of normalization theory and apply such knowledge to the normalization of a database<br>**CO5 :** Formulate, using SQL, solutions to a broad range of query and data update problems. |
| **21ADSC1**<br>**FUZZY LOGIC AND NEURAL NETWORKING** | **CO1 :** Understand the operating systems objectives and functionality along with system programs and system calls.<br>**CO2 :** Design deadlock, prevention and avoidance algorithms.<br>**CO3 :** Various Scheduling algorithms.<br>**CO4 :** Compare and contrast various memory management schemes.<br>**CO5 :** Design and Implement a prototype file systems. |
| **21AAL3**<br>**OPERATIONAL RESEARCH** | **CO1 :** Recall the theoretical foundations of various issues related to linear programming modelling to formulate real-world problems as a L P model<br>**CO2 :** Explain the theoretical workings of the graphical, simplex and analytical methods for making effective decision on variables so as to optimize the objective function<br>**CO3 :** Identify appropriate optimization method to solve complex problems involved in various industries.<br>**CO4 :** Demonstrate the optimized material distribution schedule using transportation model to minimize total distribution cost.<br>**CO5 :** Find the appropriate algorithm for allocation of resources to optimize the process of assignment. |
| **21ACL3**<br>**RELATIONAL DATABASE MANAGEMENT SYSTEM LAB** | **CO1 :** Design and implement a database schema for a given problem-domain<br>**CO2 :** Normalize a database<br>**CO3 :** Populate and query a database using SQL DML/DDL commands.<br>**CO4 :** Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS programming PL/SQL<br>**CO5 :** Knowledge about Table Joining and Recursive Functions |

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|---|---|
| **21ASB1**<br>**INTERNET OF THINGS** | **CO1 :** Explain the definition and usage of the term - Internet of Things in different contexts<br>**CO2 :** Understand the key components that make up an IoT system<br>**CO3 :** Differentiate between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack<br>**CO4 :** Apply the knowledge and skills acquired during the course to build and test a complete, working IoT system involving prototyping, programming and data analysis<br>**CO5 :** Discover where the IoT concept fits within the broader ICT industry and possible future trends |
| **GENERAL AWARENESS** | **CO1:** This course is designed to create social awareness at a preliminary level for students across the board.<br>**CO2:** To help the students to upgrade their knowledge on current challenges and issues of Indian society.<br>**CO3:** Understand and acquire the knowledge about the current information around the world.<br>**CO4:** Understand the multi-cultural diversity of Indian society through its demographic composition.<br>**CO5:** To understand the different levels of government administration. |
| **SS2**<br>**MATHEMATICAL SKILLS** | **CO1:** Problem solving techniques for aptitude problems<br>**CO2:** Prepare themselves for various competitive examinations.<br>**CO3:** Applications of simple formulae<br>**CO4:** Acquaintance to shortcut methods<br>**CO5:** Acquaintance to various elementary concepts |
| **LANGUAGE-IV** | **CO1:** சங்க கால மக்களின் வாழ்வியலை அறியச் செய்தல். ஆற இலக்கியங்கள் வழி ஒழுக்கங்களைக் கற்றல்.<br>**CO2:** நாவல் வழி வெளிப்படும் சமுதாயச் சிந்தனைகளை அறிந்து விழிப்புணர்வைப் பெறுதல்.<br>**CO3:** நவீன கருவிகளை அறியச் செய்தல்.<br>**CO4:** மொழி அறிவை வளர்த்தல், படைப்புத் திறனை வளர்த்தல்.<br>**CO5:**மாணவர்களுக்குத் தன்னம்பிக்கை மற்றும் தலைமைப் பண்பை வளர்த்தல், மாணவர்களை வேலை வாய்ப்புடன் கூடிய போட்டித் தேர்வுகளுக்குத் தயார்ப்படுத்துதல். |
| **E04**<br>**ENGLISH-IV** | **CO1:** To understand the narrative style of the renowned prolific writers' personal experiences<br>**CO2:** To analyze and demonstrate their writing skills.<br>**CO3:** To cherish the populous works of eminent classical writers.<br>**CO4:** To develop an ability to write in appropriate genres for a variety of purposes and audience<br>**CO5:** To be aware of important grammar and confidence in their own voice as a writer |
| **21ADSC2**<br>**R Programming** | **CO1 :** Understand the basic components of visual basic such as data types, arrays and control flow statements |

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|---|---|
| | **CO2 :** Work with forms, Menu box, List box and Combo box controls<br>**CO3 :** Design forms using Graphics and images<br>**CO4 :** Understand Active x controls and implement programs using them<br>**CO5 :** Understand about data base connectivity and accessing fields of database |
| **21AAL4**<br>**BUSINESS ACCOUNTING SOFTWARE**<br>**LAB** | **CO1 :** Enhances the computerized accounting skills.<br>**CO2 :** Ability to interpret the accounting & inventory statements by applying various financial tools.<br>**CO3 :** Acquire knowledge on the preparation of statutory compliance.<br>**CO4 :** Acquaint to prepare bill-wise statement.<br>**CO5 :** Learn to extract financial and inventory reports. |
| **21ASB2**<br>**BIG DATA ANALYTICS** | **CO1 :** Outline the basic big data concept.<br>**CO2 :** Categorize and summarize the processing in Big Data and its importance.<br>**CO3 :** Simulate various Big Data technologies like Hadoop, MapReduce,R and NO-SQL.<br>**CO4 :** Determine tools and techniques to analyse Big Data.<br>**CO5:** Resolve problems associated with Big Data with features of R programming. |
| **21ACL4**<br>**R Programming**<br>**LAB** | **CO1 :** Understand the basics in R programming in terms of constructs, control statements, string functions<br>**CO2 :** Understand the use of R for Big Data analytics<br>**CO3 :** Apply R programming for Text processing<br>**CO4 :** Appreciate and apply the R programming from a statistical perspective |
| **WOMEN'S RIGHTS** | **CO1:**To gain an understanding about barriers of society and impact of law to mitigate this issues<br>**CO2:**To make students understand the basic concepts in comparative politics.<br>**CO3:** To understand the relationship between patriarchy, power and violence.<br>**CO4:**To recognize key women's human rights defenders who have made important contribution to furthering the rights of women and girls.<br>**CO5:** Demonstrate a working knowledge of feminism and the field of Women and Gender Studies. |
| **SS2**<br>**MATHEMATICAL SKILLS** | **CO1 :** Problem solving techniques for aptitude problems<br>**CO2 :** Prepare themselves for various competitive examinations.<br>**CO3 :** Applications of simple formulae<br>**CO4 :** Acquaintance to shortcut methods<br>**CO5 :** Applying the techniques in real life problems |
| **CCO1/ CCO2/ CCO3**<br>**EXTENSION ACTIVITIES (NCC / NSS / SPORTS)** | **CO1 :** Identify and apply the elements of social activities<br>**CO2 :** Demonstrate effective use of government schemes and projects<br>**CO3 :** Investigate visual strengths to promote NCC activities<br>**CO4 :** Identify and apply the sustainable use of club activities<br>**CO5 :** Create the awareness to people about the environmental pollution |

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|---|---|
| **21AGC6**<br>**OPERATING SYSTEM** | **CO1 :** Understand the operating systems objectives and functionality along with system programs and system calls.<br>**CO2 :** Design deadlock, prevention and avoidance algorithms.<br>**CO3 :** Various Scheduling algorithms.<br>**CO4 :** Compare and contrast various memory management schemes.<br>**CO5 :** Design and Implement a prototype file systems. |
| **21ADSC3**<br>**PYTHON PROGRAMMING** | **CO1 :** Describe the Procedural and Object Oriented Paradigm with Concepts of Streams, Classes, Functions, Data and Objects.<br>**CO2 :** Demonstrate Adeptness of Object Oriented Programming in Developing Solutions to Problems Demonstrating Usage of Classes, Objects, Constructors and Destructors.<br>**CO3 :** Apply the Concept of Function Overloading, Operator Overloading and Classify Inheritance with the understanding of Early and Late Binding.<br>**CO4 :** Get familiar with Strings and Functions in Python<br>**CO5 :** Understand the concept of OOP's and File Handling |
| **21ADSE1A**<br>**GENERIC ELECTIVE – I**<br>**A. DATA MINING AND WAREHOUSING** | **CO1 :** Acquire knowledge about Tokens. Control Structures, Decision Making Statements – Loops in C++<br>**CO2 :** Knowledge on Class and Objects, Friend functions, Overloading member functions, and Constructor & Destructors<br>**CO3 :** Acquire knowledge about Operator Overloading, Type conversion , Inheritance, Types of inheritance, Virtual Base classes.<br>**CO4 :** Knowledge on Pointers, Pointer to class and objects, Arrays, Characteristics, Memory models and Virtual Function<br>**CO5 :** Acquire knowledge about Files and Steps of File Operations, Exception Handling, Strings |
| **21ADSE1B**<br>**GENERIC ELECTIVE – I**<br>**B. CLIENT / SERVER COMPUTING** | **CO1 :** Describe and Synthesis concepts of programming for networking, including, multithreading, delegate and event handling, remote files I/O and database connectivity.<br>**CO2 :** Develop Code for basic network and Internet protocols including sockets, stream and packet protocols such as TCP, UDP, HTTP, FTP and SMTP protocols for creating simple two tier client server applications.<br>**CO3 :** Program multi-tier client server computing systems with remote and web services protocols for creating distributed client server systems.<br>**CO4 :** Design and develop specialized client server systems with better security, scalability, queuing, and optimal performance and bandwidth utilization.<br>**CO5 :** Program different network programming tools, network monitoring, tracking and analyzing advanced client server systems. |
| **21ADSE1C**<br>**GENERIC ELECTIVE 1 :**<br>**C. SOFTWARE ENGINEERING** | **CO1 :** Plan a software engineering process life cycle , including the specification,<br>design, implementation, and testing of software systems<br>**CO2 :** Evaluate the quality of the requirements, analysis and design work done during the module.<br>**CO3 :** Design and communicate ideas about software system solutions at different levels |

| Course Code and Course Name | Course Outcomes |
|---|---|
| | **CO4 :** Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology<br>**CO5 :** Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice |
| **21ADSE1D**<br>**GENERIC ELECTIVE – I**<br>**C. INDUSTRY 4.0** | **CO1 :** Acquire knowledge about Industry 4.0 and for digital transformation<br>**CO2 :** Familiarize and learn the student with the concept of Artificial Intelligence.<br>**CO3 :** To enable the students to understand the Big data and data analytics<br>**CO4 :** Insight into the various methods of applications and tools of Industry 4.0<br>**CO5 :** Students can attain confident and necessary skills to attend their jobs 2030 |
| **21AGE1D**<br>**GENERIC ELECTIVE – I**<br>**D.SOFTWARE ENGINEERING** | **CO1 :** Plan a software engineering process life cycle , including the specification, design, implementation, and testing of software systems<br>**CO2 :** Evaluate the quality of the requirements, analysis and design work done during the module.<br>**CO3 :** Design and communicate ideas about software system solutions at different levels<br>**CO4 :** Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.<br>**CO5 :** Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice |
| **21ADSE1A**<br>**DISCIPLINE SPECIFIC ELECTIVE1:**<br>**A.DEEP LEARNING** | **CO1 :** Understand the basic concepts and techniques of Deep Learning<br>**CO2 :** To understand and apply the Machine learning principles<br>**CO3 :** To study the deep learning architectures<br>**CO4 :** Explore and create deep learning applications with tensor flow<br>**CO5 :** Process text data using embedding |
| **21ADSE1B**<br>**DISCIPLINE SPECIFIC ELECTIVE1:**<br>**B. BLOCK CHAIN TECHNOLOGY** | **CO1 :** Understand block chain technology and the role of decentralization in block chain<br>**CO2 :** Discuss the key concepts of symmetric cryptography and public key cryptography<br>**CO3 :** Analyze consensus algorithms and understand the concept of bit coin<br>**CO4 :** Explore bit coin network payments, bit coin clients and APIs<br>**CO5 :** Demonstrate smart contract templates, alternative coins, and build smart contracts |
| **21ADSE1C**<br>**DISCIPLINE SPECIFIC EL ECTIVE1:**<br>**C.FUNDAMENTALS OF ROBOTICS** | **CO1 :** Demonstrate knowledge of industrial robots, characteristics, end affecters an actuators.<br>**CO2 :** Apply spatial transformation to obtain forward and inverse kinematics<br>**CO3:** Solve robot dynamics problems, generate joint trajectory for path planning.<br>**CO4 :** Describe working principle of various sensors and program different operations. |

| Course Code and Course Name | Course Outcomes |
|---|---|
| | **CO5 :** Appreciate applications of robots in industry |
| **21ASB3 SKILL BASED 3 : ARTIFICIAL INTELLIGENCE** | **CO1 :** Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. .<br>**CO2 :** Understanding about the basic concepts of software agents ad representation of knowledge<br>**CO3 :**Demonstrate awareness and a fundamental understanding of various applications of AI techniques.<br>**CO4 :**Understanding the intelligent agents, expert systems, artificial neural networks and other machine learning models<br>**CO5 :**Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. |
| **21ACL5 PYTHON PROGRAMMING LAB** | **CO1 :** Basics of Python programming<br>**CO2 :** Decision making and functions in Python<br>**CO3 :** Function mechanism in Python<br>**CO4 :** Object oriented Programming using Python<br>**CO5 :** File handling in Python |
| **21ACIR INTERNSHIP / FIELD PROJECT** | **CO1 :** To Integrate theory with practical.<br>**CO2 :** To give opportunity to students to work with industrial expert.<br>**CO3 :** To introduce students to work culture.<br>**CO4 :** Acquire skills in communication, management team work.<br>**CO5:** To understand scope, functions and job responsibilities in various departments of an organization |
| **SS3 MANAGERIAL SKILLS** | **CO1 :** Develop and effectively communicate through verbal/oral communication and improve the listening skills.<br>**CO2 :** Develop and actively participate in group discussion / meetings / interviews and prepare & deliver presentations.<br>**CO3 :** Understand and develop effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.<br>**CO4 :** Understand the individual through goal/target setting, self motivation and practicing creative thinking.<br>**CO5 :** Acquire the knowledge about the reasoning ability and mental attitude. |
| **21AGC7 COMPUTER NETWORKS** | **CO1 :** Understand the concepts of networks, types and architectures.<br>**CO2 :** Apply addressing entities of network with implementation of TCP and UDP protocols.<br>**CO3 :** Identify the networks technologies for error free transmission of data<br>**CO4 :** Apply various routing protocols in data communication to select optimal path.<br>**CO5 :** Develop real time applications of networks |
| **21ADSC4 MACHINE LEARNING** | **CO1 :** Understand the basic concepts and techniques of Machine Learning.<br>**CO2 :** Explain the regression methods, classification methods, clustering methods.<br>**CO3 :** Understand the inference and learning algorithms for the hidden Markov model.<br>**CO4 :** Demonstrate Dimensionality reduction Techniques<br>**CO5 :** Appreciate the underlying mathematical relationships within and |

| Course Code and Course Name | Course Outcomes |
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| | across Machine Learning algorithms and the paradigms of supervised and un-supervised learning. |
| **21ADSC5 NATURAL LANGUAGE PROCESSING** | **CO1 :** To understand the general concepts of PHP scripting language for the development of Internet websites.<br>**CO2 :** Use PHP logical and comparison operators, branching structures (if/switch), and loop structures (for, for each, do, do/while)<br>**CO3 :** Use HTML form elements that work with any server-side language.<br>**CO4 :** Create a PHP web page that is unique to each visitor<br>**CO5 :** Working with Database and SQL and connect the both ends |
| **21ADSE2A DISCIPLINE SPECIFIC ELECTIVE – 2 A. MOBILE APPLICATION DEVELOPMENT** | **CO1 :** Know the basic concepts and technique of developing applications for the android mobile environment.<br>**CO2 :** Able to use the SDK and other development tools. And the basic concepts of Android phone features and capabilities.<br>**CO3 :** Be able to understand Java programming as it related to application development for the Android platform.<br>**CO4 :** Working with Android Operating System and Mobile Application development Tools<br>**CO5 :** Understand about data base connectivity and accessing fields of database |
| **21ADSE2B DISCIPLINE SPECIFIC ELECTIVE – 2 B. CRYPTOGRAPHY AND NETWORK SECURITY** | **CO1 :** Understand the concepts of information security.<br>**CO2 :** Apply addressing entities of network with implementation of TCP and UDP protocols.<br>**CO3 :** Identify the networks technologies for error free transmission of data<br>**CO4 :** Apply various routing protocols in data communication to select optimal path.<br>**CO5 :** Well versed with System Security, Malicious Software and Firewalls |
| **21ADSE2C DISCIPLINE SPECIFIC ELECTIVE – 2 PHP PROGRAMMING** | **CO1 :** To understand the general concepts of PHP scripting language for the development of Internet websites.<br>**CO2 :** Use PHP logical and comparison operators, branching structures (if/switch), and loop structures (for, for each, do, do/while)<br>**CO3 :** Use HTML form elements that work with any server-side language.<br>**CO4 :** Create a PHP web page that is unique to each visitor<br>**CO5 :** Working with Database and SQL and connect the both ends |
| **21AIDE INTER DISCIPLINARY ELECTIVE: K.PRINCIPLES OF ARTIFICIAL INTELLIGENCE** | **CO1 :** Understand basic principles of AI in solutions that require problem solving, inference, knowledge representation and learning.<br>**CO2 :** Understand knowledge representation using logic and rules<br>**CO3 :** Analyze various AI techniques in expert systems, artificial neural networks and other machine learning models.<br>**CO4 :** Analyze the main approaches to natural language processing and expert systems. |
| **21ACL6 MACHINE LEARNING LAB** | **CO1 :** Understand the basic concepts and techniques of Machine Learning.<br>**CO2:** Explain the regression methods, classification methods, clustering methods<br>**CO3:** Understand the inference and learning algorithms for the hidden |

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|---|---|
| | Markov model.<br>**CO4:** Demonstrate Dimensionality reduction Techniques<br>**CO5:** Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning. |
| **21ACPV**<br>**PROJECT & VIVA-VOCE** | **CO1 :** Analyse the problem Domain<br>**CO2 :** Find the best Computer Language and implement<br>**CO3 :** Develop a project model and get approval from the user<br>**CO4 :** Develop final software model<br>**CO5 :** Test and Implement the software in the customer site. |
| **SS3**<br>**MANAGERIAL SKILLS** | **CO1 :** To develop and effectively communicate through verbal/oral communication and improve the listening skills.<br>**CO2 :** To develop and actively participate in group discussion / meetings /interviews and prepare &deliver presentations.<br>**CO3 :** To understand and develop effectively in multi-disciplinary and heterogeneous to through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.<br>**CO4 :** To understand the individual through goal/target setting, self motivation and practicing creative thinking. |
| **CLUB ACTIVITY** | **CO1:** Identify and apply the elements of club activities<br>**CO2:** Demonstrate effective use of government schemes and projects<br>**CO3:** Investigate visual strengths to promote club activities<br>**CO4:** Identify and apply the sustainable use of club activities<br>**CO5:** Create the awareness to the student about club activities |