

PRIYADARSHINI COLLEGE OF ENGINEERING
Department of Robotics & Artificial intelligence
Course Outcomes(CO)

Semester-3rdSem

Subject: Discrete Mathematics and Graph Theory		Subject Code: BTechRAI301T
By the end of the course students will be able to:		
CO1	Use logical notations to define the fundamental mathematical concepts such as sets relations and functions.	
CO2	Acquire Knowledge about how mathematical models for engineering are designed, analyzed and implemented in industry and organizations.	
CO3	Understand basic data types and structures (such as numbers, sets, graphs, and trees) used in computer algorithms and systems.	
CO4	Formulate graph theoretic models to solve real world problems	
CO5	Solve the counting problems using Combinatorics	

Subject: Operating System		Subject Code: BTechRAI-302T
By the end of the course students will be able to:		
CO1	Analyze basic concepts of operating system and their structures.	
CO2	Understand different process scheduling algorithms to achieve better performance of a computer system.	
CO3	Interpret the issues and challenges of memory management.	
CO4	Understand different synchronization techniques to achieve better performance of a computer system.	
CO5	Analyze different methods for preventing or avoiding deadlocks in a computer system	

Subject: Principal Of Robotics		Subject Code: BTechRAI-303T
By the end of the course students will be able to:		
CO1	Identify & understand the basic concept of robotics	
CO2	To analyze Instrumentation systems and their applications to various types of robot	
CO3	Design the differential motion and add statics in robotics.	
CO4	To demonstrate about the various path planning techniques	
CO5	To demonstrate about the dynamics and control in robotics industries	

Subject: Data Structure and Algorithm Design		Subject Code: BTechRAI-304T
By the end of the course students will be able to:		
CO1	understanding basic data structures & various sorting and searching algorithms	
CO2	Apply the different linear data structures like stack and queue to various computing problems.	
CO3	Understand basic applications for Linked List	
CO4	Implement different types of trees and apply them to problem solutions.	
CO5	Solve problem involving graphs, trees and heaps	

Subject: Analog and Digital Circuits		Subject Code: BTechRAI-305T
By the end of the course students will be able to:		
CO1	Recall and Recognize construction and characteristics of JFETs and MOSFETs and differentiate with BJT	
CO2	Demonstrate and Analyze Operational Amplifier circuits and their applications	
CO3	Describe, Illustrate and Analyze Combinational Logic circuits	
CO4	Describe, Design and Analyze Synchronous and Asynchronous Sequential circuits	
CO5	Explain and design registers and Counters, A/D and D/A converters	

Subject: Professional Skill Python		Subject Code: BTechRAI-306T
By the end of the course students will be able to:		
CO1	Understand the environment of Python Programming	
CO2	Apply the operation on conditions using simple programs	
CO3	Analyze the different platform on the same conditions of program structures	
CO4	Recognize built-in and User-defined module	
CO5	Understand the use of inheritance	
CO6	Apply handling of user defined exception	

Subject: Universal Human Values		Subject Code: BTechRAI-307T
By the end of the course students will be able to:		
CO1	Become more aware of themselves, and their surroundings (family, society,nature)	
CO2	Become more responsible in life, and in handling problems with sustainable solutions,while keeping human relationships and human nature in mind.	
CO3	Become sensitive to their commitment towards human relationship	
CO4	Become sensitive to their commitment towards what they have understood (human values, human relationship and human society).	

Subject: Environmental Science		Subject Code: BTechRAI-308T
By the end of the course students will be able to:		
CO1	Understand the natural sources available.	
CO2	Understand about ecosystem, biodiversity, pollution.	
CO3	Understand the effect on environment on social aspects and Human population.	
CO4	Understand Environmental issues related with social and human population	

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Course Outcomes(CO)

Semester-4th Sem

Subject: Introduction to Artificial Intelligence		Subject Code: BTechRAI-401T
By the end of the course students will be able to:		
CO1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.	
CO2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.	
CO3	Create an understanding of the basic issues of knowledge representation.	
CO4	Formulate and solve problems with uncertain information using Bayesian approaches.	
CO5	Attain the capability to represent various real life problem domains using logic based techniques .	

Subject: Computer Network		Subject Code: BTechRAI-402T
By the end of the course students will be able to:		
CO1	Understand the concepts of data communication and networks, TCP/IP and OSI reference models.	
CO2	Understand the services of data link layer, protocols , multiple access protocols and Ethernet	
CO3	Understand the services of network layer and IP-based protocols	
CO4	Understand the services of transport layer , TCP & UDP Protocol	
CO5	Understand the services of application layer Protocols and internet security	

Subject: Robotics Sensor Technology		Subject Code: BTechRAI-403T
By the end of the course students will be able to:		
CO1	Identify & understand the basic and the latest technology of sensors used in robots	
CO2	To demonstrate and Analyze sensory systems in robotics.	
CO3	To demonstrate the understanding of Selection of the sensor for a robotic application and design the system	
CO4	To demonstrate the understanding of actuators and configuring the parameters of Actuator wrt to a sensor.	

Subject: Object Oriented Programming		Subject Code: BTechRAI-404T
By the end of the course students will be able to:		
CO1	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in Java	
CO2	Design and develop concept of Inheritance and Polymorphism.	
CO3	Design and object oriented system with packages and interfaces.	
CO4	To demonstrate the concept of String handling	
CO5	Design an object-oriented system, AWT components and multithreaded processes as per needs and specifications	

Subject: Robot Kinematics		Subject Code: BTechRAI-405T
By the end of the course students will be able to:		
CO1	To demonstrate the concepts of displacement, velocity, acceleration and coordinate transformation analysis of robotic mechanisms	
CO2	To demonstrate the understanding of the profile of cams and its analysis, gear kinematics with gear train calculations, theory of friction, clutches, brakes & dynamo meters.	
CO3	To demonstrate the understanding of relative motion analysis, serial and parallel manipulator velocity analysis, graphical and analytical analysis of position, velocity and acceleration and coordinate analysis of a robot.	
CO4	To demonstrate an understanding of Planning trajectories for the end effectors (tool) to follow in order to perform meaningful tasks. To precisely control the high speed motion of the system.	

Subject: Intelligent Embedded System		Subject Code: BTechRAI-406T
By the end of the course students will be able to:		
CO1	Understand architecture, instruction set and programming of embedded processors and controllers.	
CO2	Provide the basic knowledge of Arduino.	
CO3	Learn to interface sensors and Actuators with Arduino.	
CO4	Provide the basic knowledge of Node MCU.	
CO5	Learn to interface sensors and Actuators with Node MCU.	

PRIYADARSHINI COLLEGE OF ENGINEERING
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Course Outcomes(CO)

Semester-5th Sem

Subject: Robot Dynamics		Subject Code: BTechRAI-501T
By the end of the course students will be able to:		
CO1	Understand and explain the fundamental concept & Principles of robot dynamics.	
CO2	Analyze and Predict the motion of robot manipulators and mobile robots.	
CO3	Derive and solve the equations of motion for robotic system.	
CO4	Apply mathematical models and algorithms to simulate and control robot dynamics.	
CO5	Identify and address the challenges and limitations associated with robot dynamics.	

Subject:Machine Learning		Subject Code: BTechRAI-502T
By the end of the course students will be able to:		
CO1	Understand basics of Machine Learning Technquies..	
CO2	Understand Different types of Regression technquies.	
CO3	Be capable of applying classification technquies.	
CO4	Apply unsupervised machine learning technquies.	
CO5	Apply & evaluate the machine learning technquies to real world problems.	

Subject: Robot Drive System		Subject Code: BTechRAI-503T
By the end of the course students will be able to:		
CO1	Understand the Principles of operatin and characterstics of DC machines.	
CO2	Have the knowledge of electrical transformers and inductin motors.	
CO3	Visualize the operation of synchronous motors stepper and servo motors.	
CO4	Understand power transmission and distribution.	

Subject: Design and analysis of algorithms		Subject Code: BTechRAI-504T
By the end of the course students will be able to:		
CO1	Understand mathematical formulation, complexity analysis and methodologies to solve the recurrence relations for algorithms.	
CO2	Design Greedy and Divide and Conquer algorithms and their usage in real life examples.	
CO3	Design Dynamic programming and Backtracking Paradigms to solve the real life problems.	
CO4	Assess the limitations of algorithmic power and re frame methodologies to cope with them.	
CO5	Understand NP class problems and formulate solutions using standard approaches.	

Subject:Field and Service robotics(Elective-I)		Subject Code: BTechRAI-505.1T
By the end of the course students will be able to:		
CO1	Understand the various parts of robots and field of robotic.	
CO2	Understand the various kinematics and inverse kinematics of robots.	
CO3	Analyze about the localization, planning and navigation.	
CO4	Access the designing about the humanoid robots.	

Subject: Theory Of Computation(Elective-II)		Subject Code: BTechRAI-505.2T
By the end of the course students will be able to:		
CO1	Design the formal relationships among machines, languages and grammar.	
CO2	Design and Optimize finite automata for given regular language.	
CO3	Design Push Down Automata, Turing Machine for given languages.	
CO4	Demonstrate use of computability, decidability, recursive function theory through Problem solving.	

Subject: Wireless Communication Technologies(Elective-II)		Subject Code: BTechRAI-505.3T
By the end of the course students will be able to:		
CO1	To be able to design solutions for cellular communication.	
CO2	To be able to compute the capacity of wireless channels.	
CO3	To be able to analyze the performance of the digital modulation techniques in finding channels.	
CO4	To apply various diversity techniques in wireless communication.	
CO5	To design multicarrier systems in wireless communication.	

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Course Outcomes(CO)
Semester-6th Sem

Subject: Deep Learning		Subject Code: BTechRAI601T
By the end of the course students will be able to:		
CO1	Understand the fundamentals of deep learning.	
CO2	Gain Knowledge of different modalities of deep learning currently used.	
CO3	Gain Knowledge of about state of the art models and others important works in recent years.	
CO4	Learn the skills to develop Deep Learning based AI systems.(Use of multiple packages etc.)	
CO5	Develop applicatin of Deep Learning for Data Science	

Subject: Automation System Design		Subject Code: BTechRAI-602T
By the end of the course students will be able to:		
CO1	To apply knowledge of industrial automation by transfer lines and automated assembly lines.	
CO2	To design an automated system.	
CO3	To understand automated controls using pneumatic and hydraulic systems.	
CO4	To understand automated electronic control systems in metal machining and other manufacturing process.	
CO5	To understand advancements in hydraulics and pneumatics systems.	

Subject: Internet of things and its applications		Subject Code: BTechRAI-603T
By the end of the course students will be able to:		
CO1	Understand the concepts of Internet of Things.	
CO2	Understand the concepts the concept of AI for IoT.	
CO3	Analyze IoT protocols for sensor network.	
CO4	Analyze IoT application using Arduinio and Raspberrypi Programming	
CO5	Design IoT Application in different domain and analyse its performance.	

Subject: Compiler Design (Elective II)		Subject Code: BTechRAI-604.1T
By the end of the course students will be able to:		
CO1	Demonstrate the different phases of compiler using various programming language.	
CO2	Construct a lexical analyzer using deterministic finite automataand non deterministic finite automata	
CO3	Implement the parser for a given Context Free Grammer using various parsing methods.	
CO4	Implement the intermediate code generation techniques and runtime environment.	
CO5	Analyze the code generation techniques.	

Subject: Block chain & Cyber Security(Elective-II)		Subject Code: : BTechRAI-604.2T
By the end of the course students will be able to:		
CO1	To understand fundamentals of cyber security and Blockchain Technology.	
CO2	To learn models of Blockchain.	
CO3	Analyze and demonstrate Ethereum.	
CO4	Analyze and demonstrate Hyperledger fabric.	

Subject:Robotic And intelligent System (Elective-II)		Subject Code: BTechRAI-604.3T
By the end of the course students will be able to:		
CO1	Identify problems that are amenable to solution by AI methods.	
CO2	Identify appropriate AI methods to solve a given problems	
CO3	Formalize a given problem in the language/framework of different AI methods.	
CO4	Summarize the learning methods adopted in AI.	
CO5	Design and perform an empirical evaluation of different algorithms on a problem formulization & Illustrate the application of AI in Robotic Application.	

Subject: Robotic Process Automation (Elective-II)		Subject Code: BTechRAI604.4T
By the end of the course students will be able to:		
CO1	Understand the RPA and the ability to differentiate it from other types of automation & Model the sequences and the nesting of activities.	
CO2	Understand to store and manipulate data in a more persistent way using such files as CSV and Excel.	
CO3	Model the workflow of different scraping methodologies. Understand Image text and Data Tables Automation	
CO4	Understand to handle the exceptions and will troubleshoot towards the solution.	
CO5	Experiment with workflow in a manner to get the optimized output from a BOT.	

Subject: Current Trends in image processing & Pattern Recognition (Open Elective-II)		Subject Code: BTechRAI-605-1T
By the end of the course students will be able to:		
CO1	Describe the basic concept of image processing with mathematical interpretation.	
CO2	Apply the knowledge of different image enhancement, and image registration techniques.	
CO3	Demonstrate the various image segmentation and morphological operations for partition of objects.	
CO4	Describe the fundamental concepts of various features extraction techniques, and recognize the image scene from image feature.	
CO5	Analyze and implement image processing techniques for various real time applications such as industry, medicine and defense.	

Subject: Mobile Robotics (Open Elective-II)

Subject Code: BTechRAI-605-2T)

By the end of the course students will be able to:

CO1 Understand and explain the fundamental concepts and principles of robot dynamics.

CO2 Analyze and Predict the motion of robot manipulators and mobile robots.

CO3 Derive and solve the equation of motion for robotic systems.

CO4 Apply mathematical models and algorithms to stimulate and control robot Dynamics;

CO5 Identify and address the challenges and limitations associated with robot dynamics.

