SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Electrical Engineering

Semester/Year		IV/II	Program		B.Tech
Subject Category	OC	Subject Code:	EEO 405 (A)	Subject Name:	Artificial Intelligence

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				**Practical**			Total Marks				
ES	MS	Quiz	Assig	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	-	-	3

Prerequisites:

Basic Mathematics, Programming Skills, Probability and Statistics, Linear Algebra, Basic Electrical Engineering, Logic and Reasoning

Course Objective:

1. To provide insight into fundamentals of Artificial Intelligence Techniques to the students.
2. To convey application of Artificial Intelligence techniques in power system.

Course outcome:

CO1: Understanding AI Fundamentals, principles, and techniques of AI.
CO2: Knowledge of AI Algorithms and Learning Techniques.
CO3: Students will develop fuzzy logic concepts
CO4: Students will analyze the Genetic Algorithms working and concepts.
CO5: Students will apply AI applications in different fields.

UNITs	Descriptions	Hrs.	CO's
I	Artificial Intelligence: History of AI and its Applications , Importance, Definitions, Progress of Artificial Intelligence, Growth of AI, AI and Industry, AI and the world, Current Trends in Applied AI.	8	CO1
II	Artificial Neural Network: difference between human machine and intelligence, biological neural network, artificial neuron model, Concept of Perceptron, Feedback in Neural Network, Neural Network Architectures: Neural Learning.	8	CO2
III	Fuzzy Logic: Introduction, Foundation of Fuzzy Systems, Representing Fuzzy Elements, Basic Terms and Operations, Properties of Fuzzy Sets, Fuzzification, Arithmetic Operations of Fuzzy Numbers, Defuzzification Methods.	8	CO3
IV	Genetic Algorithms: Introduction, Genetic Algorithms, Procedure of Genetic Algorithms, Genetic Representations, Initialization and Selection, Genetic Operators, Mutation, The Working of Genetic Algorithms.	8	CO4
V	Application of AI: Neural network application in real world (image processing, speech recognition health care), Genetic algorithm and fuzzy logic implementation in real life problems.	8	CO5
Expert Lecture			
Total Hours		40	

Suggestive list of experiments:

Signature of BoS members:

No Lab				
Text Book- 1. S. Rajashekran, and G.A. Vijaylaksmi Pai., Neural Networks, Fuzzy Logic and Genetic Algorithm Synthesis and Applications, McGraw Hall of India Private Limited, 2007. 2. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach",Pearson, 4th Edition, 2020.				
Reference Books- 1. Amit Konar,"Artificial Intelligence and Machine Learning: Fundamentals, Algorithms, and Applications", CRC Press, 2nd Edition, 2019. 2. Sanjeevikumar Padmanaban, Sivaraman Palanisamy, Sharmeela Chenniappan, Jens Bo Holm-Nielsen,Artificial Intelligence-based Smart Power Systems, Wiley, February 2023.				
Modes of Evaluation and Rubric				
Theory (60)	Attendance (10)	Midsem (10 + 10)	Performance (10)	Total (100)
List/Links of e-learning resource				
Coursera - Artificial Intelligence by Andrew Ng: https://www.coursera.org/learn/ai-for-everyone				
Recommendation by Board of studies on		7th June 2023		
Approval by Academic council on				
Compiled and designed by		Dr. Shilpi Tomar		
Subject handled by department		Electrical Engg. Deptt.		

Signature of BoS members:

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Department of Electrical Engg.

Semester/Year		IV/II	Program		B.Tech
Subject Category	OC	Subject Code:	EE 405(B)	Subject Name:	Application of IoT in Electrical Engineering

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assig	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	-	-	3

Prerequisites:

Basic Electronics, Physics, Network Analysis

Course Objective:

Understanding core technology, applications, sensors used and IOT architecture along with industry perspective. Principles and operations of different types of sensors commonly used mobile platform will be taught in a manner that by the end of the course the students will be able t design and implement real time solutions using IOT.

Course Outcomes:

After completion of course, students would be able to:

CO1. Understand core technology, applications, sensors used and IOT architecture along with the industry perspective.
CO2. Understand Raspberry's working and implementation.
CO3. Understand various communication protocols used in IoT.
CO4. Apply various IOT technologies in real-life applications.
CO5. Understand the applications of various sensors in real-world technologies such as Google Maps, WhatsApp, Waze, and Ola etc.

UNITs	Descriptions	Hrs.	CO's
I	Introduction to IoT: What is IoT, how does it work? Difference between Embedded device and IoT device, Properties of IoT device, IoT Ecosystem, IoT Decision Framework, IoT Solution Architecture Models, Major IoT Boards in Market.	8	CO1
II	Setting Up Raspberry/Arduino to Create Solutions: Explore Raspberry Pi, setting up Raspberry Pi, showing working of Raspberry Pi using SSH Client and Team Viewer, Understand Sensing actions, Understand Actuators and MEMS.	8	CO2

Signature of BoS members:

III	Communication Protocols used in IoT: Types of wireless communication, Major wireless Shortrange communication devices, properties, comparison of these devices (Bluetooth, WIFI, ZigBee, 6LoWPAN), Major wireless Long-range communication devices, properties, comparison of these devices (Cellular IoT, LPWAN).	8	CO3
IV	IoT Applications: Industrial Internet 4.0, Applications such as: Smart home, wearables, smart city, smart grid, connected car, connected health (digital health, telehealth, telemedicine), smart retail.	8	CO4
V	Sensors: Applications of various sensors: Google Maps, Waze, WhatsApp, Ola, Positioning sensors: encoders and accelerometers, Image sensors: cameras, Global positioning sensors.	8	CO5
Expert Lecture			
Total Hours		40	

Suggestive list of experiments:				
No Lab				
Text Book- 1. Internet of Things, Vasudevan, Nagrajan and Sundaram, Wiley India 2. IoT Fundamentals, David Hence at el, Cisco Press				
Reference Books- 1. IoT Based Projects, Rajesh Singh at el, BPB 2. Internet of Things with ARDUINO and BOLT, Ashwin Pajankar, BPB				
Modes of Evaluation and Rubric				
Theory (60)	Attendance (10)	Mid Sem (10 + 10)	Performance (10)	Total (100)
List/Links of e-learning resource				
NPTEL				

Recommendation by Board of studies on	7th June 2023
Approval by Academic council on	
Compiled and designed by	Dr. Jitendra Kumar Tandekar
Subject handled by department	Electrical Engg.

Signature of BoS members: