MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

Deemed University

(Declared under Distinct Category by Ministry of Education, Government of India)

NAAC ACCREDITED WITH A++ GRADE

DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: AIML(2200617/2140617)	**Class:** B. Tech. III Year	**Session:** Jan-June 2025

S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Definition, Goals of AI, Task of AI, Computation,	1	Offline & Open discussions
2.		Psychology and Cognitive Science. Perception, Understanding, and Action.	2	Offline & Open discussions
3.		Artificial intelligence vs machine learning vs deep learning and other related fields.	3	Offline & Open discussions
4.		Applications of Artificial intelligence and Machine Learning in the real world.	4-5	Offline & Demonstration based learning
5.	Unit 2	Production System, Blind Search: BFS & DFS	6-8	Offline & problem solving based learning
6.		Heuristic Search, Hill Climbing, Best First Search.	7-10	Offline & Open discussions
7.		Introduction to Neural Networks: History, Biological Neuron	11	Offline
8.		Artificial Neural Network, Neural Network Architectures, Classification, & Clustering	12-15	Offline & problem solving based learning
9.	Unit 3	Traditional Programming vs Machine learning. Key Elements of Machine Learning: Representation, process	16-17	Offline
10.		(Data Collection, Data Preparation, Model selection, Model Training, Model Evaluation and Prediction), Evaluation and Optimization.	18-20	Offline & problem solving based learning
11.		Types of Learning	21	Offline & problem solving based learning

12.		Supervised, Unsupervised and reinforcement learning.	22	Offline & problem solving based learning
13.		Regression vs classification problems.	23-24	Offline & problem solving based learning
14.	**Unit 4**	Linear regression:implementation, applications & performance parameters.	25-26	Offline & Open discussions
15.		Decision tree classifier, terminology, classification vs regression trees, tree creation with Gini index and information gain,	27-29	Online & demonstration based learning
16.	**Unit 5**	Introduction, types: Partitioning, density based, DBSCAN	30	Offline & Open discussions
17.		distribution modelbased, hierarchical, Agglomerative and Divisive,	31-32	Online & demonstration based learning
18.		Common Distance measures, K-means clustering algorithm.	33	Offline & demonstration based learning
19.		Case study on clustering for solving real world problems.	34	Offline & demonstration based learning
20.		numerical based on it	35	Offline & problem solving based learning

Dr. Shubhi kansal

Dr. R. P. Narwaria

Madhav Institute of Technology & Science, Gwalior

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Electronics Engineering

Name of Course with Code: Microcontroller Systems and Applications (2140616/2200616)	**Class:** B. Tech. IIIYear	**Session: January-June 2025**

S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Introduction to Microcontrollers: Definition, Classification (8-bit, 16-bit, 32-bit), Challenges and Design Issues	1.	Offline & Open discussions
2.		Von Neumann/Harvard Architectures, CISC vs. RISC	2.	Black Board Teaching
3.		Microcontroller Types and Selection Criteria	3.	Black Board Teaching
4.		Overview of the 8051 Family: History and Variants	4.	Black Board Teaching
5.		8051 Architecture: Block Diagram, Internal Components	5.	Black Board Teaching
6.		8051 Pin Description and I/O Configuration	6.	Black Board Teaching
7.		8051 Flags, Register Banks, and Special Function Registers (SFRs)	7.	Black Board Teaching
8.		8051 Internal Memory Organization and Addressing Modes	8.	Black Board Teaching & problem solving based learning
9.	Unit 2	Introduction to 8051 Instruction Set: Data Transfer Instructions	9.	Online&demonstrationbasedlearning
10.		Arithmetic and Logical Instructions	10.	Black Board Teaching &Group based Learning
11.		Jump, Loop, and Call Instructions	11.	Black Board Teaching & problem solving based learning
12.		Introduction to 8051 Assembly Programming: Assembler Directives, Program Structure	12.	Black Board Teaching & problem solving based learning
13.		Assembling and Running an 8051 Program: Debugging Techniques	13.	Black Board Teaching & problem solving based learning
14.		I/O Port Programming: Bit Manipulation, Simple I/O Programs	14.	Black Board Teaching & problem solving based learning
15.	Unit 3	Introduction to Pipelining Based Processors: Basic Concepts, Advantages	15.	Black Board Teaching
16.		Applications of ARM Processors	16.	Black Board Teaching
17.		ARM Cortex-M3 Architecture: Overview, Block Diagram	17.	Black Board Teaching
18.		ARM Cortex-M3 General Purpose Registers and Special Registers	18.	Black Board Teaching
19.		ARM Cortex-M3 Exceptions, Interrupts,	19.	Online&demonstrationbasedlea

		and Stack Operation		rning
20.	**Unit 4**	Memory Address Decoding and 8051 Interfacing with External Memory	20.	Black Board Teaching &Open discussions
21.		8051 Interface with 8255 PPI: Programmable Peripheral Interface	21.	Black Board Teaching & problem solving based learning
22.		8051 Interfacing with LCD Displays: Character LCDs, Programming	22.	Black Board Teaching / Slides&Group based Learning
23.		8051 Interfacing with Matrix Keyboards: Keypad Scanning Techniques	23.	Black Board Teaching / Slides Learning through experimentation
24.		8051 Interfacing with ADC (Analog-to-Digital Converter): Principles, Interfacing Methods	24.	Black Board Teaching / Slides Learning through experimentation
25.		8051 Interfacing with DAC (Digital-to-Analog Converter): Principles, Interfacing Methods	25.	Black Board Teaching / Slides Activity based Learning
26.		8051 Interfacing with Stepper Motors: Control Methods, Programming	26.	Black Board Teaching &Learning through projects
27.	**Unit 5**	Overview of Arduino: History, Ecosystem, IDE	27.	Flipped Class Online Mode
28.		Arduino Configuration and Interfacing Basics	28.	Black Board Teaching / Slides
29.		Arduino Board Layout and Atmega328 Specifications	29.	Black Board Teaching / Slides + Activity based Learning
30.		Arduino Interfacing with LEDs and Switches	30.	Black Board Teaching / Slides + Activity based Learning
31.		Arduino Interfacing with Light Dependent Resistors (LDRs)	31.	Black Board Teaching / Slides + Activity based Learning
32.		Arduino PWM (Pulse Width Modulation) and Applications	32.	Flipped Class Online Mode
33.		Arduino Interfacing with 16x2 LCD Displays	33.	Black Board Teaching / Slides + Activity based Learning
34.		Arduino Serial Communication	34.	Learning through projects + Learning through experimentation
35.		Arduino Interfacing with L293D Motor Driver	35.	Black Board Teaching &Learning through projects

Online	Offline						
	BlackBoardTeaching	GroupbasedLearning	Learningthroughprojects	Learningthroughdemonstration	Learningthroughexperimentation	ActivitybasedLearning	Open discussion
10.26%	56.1%	7.69%	7.69%	2.56%	10.26%	7.69%	5.13%

Dr. Jaydeep Singh Parmar

Dr. Varun Mishra

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Multiple Mode Teaching Learning Pattern

Name of Course with Code OC-I Intelligent Control (900117)			**Class** B. Tech. III Year (VI Sem)		**Session** Jan-June 2025
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**CO**	**Mode**
1.	**Unit 1**	Introduction of Subject, Scheme, Syllabus and CO Discussion	1-3	1	Offline & Open discussions
2.		Control System Basics, Few Examples	4-6	1	Offline & group based learning
3.		Linear Control System, Manual control and Automatic Control System	7	1	Offline & Open discussions
4.		Introduction of Adaptive Control Systems Open Loop and Close loop adaptive Control System.	8	1	Offline & open discussion
5.		Parameter estimation using least square and recursive least square techniques	9	1	Offline & Open discussions
6.		Self-tuning Controller, Self Tuning Regulators	10	1	Offline & Open discussions
7.		Adaptive Smith predictor control	11	1	Offline & problem solving based learning
8.		Auto tuning and self-tuning smith predictor.	12	1	Offline & problem solving based learning
9.		Gain Scheduling,	13	1	Offline & problem solving based learning
10.		Model Reference Adaptive Control	14	1	Offline & demonstration based learning
11.	**Unit 2**	Introduction to Artificial Neural Network (ANN)	15-18	2	Offline & problem solving based learning
12.		Different activation functions	19	2	Offline & problem solving based learning
13.		Different architectures and different learning methods	20	2	Offline and open discussion, learning through project
14.		Back Propagation.	21-22	2	Offline & Open discussions
15.		Radial Basis Function networks	23	2	Offline & Open discussions
16.	**Unit 3**	Modeling of Control System: Representation and identification	24	3	Offline & Open discussions
17.		Modeling the plant, Control Structures– Supervised control	25	3	Offline & Open discussions
18.		Model reference control, Internal model	26	3	Offline & Open

		control, Predictive control			discussions
19.		Indirect and direct adaptive controller design using neural network.	27-28	3	Offline & Open discussions
20.	**Unit 4**	Introduction Fuzzy Controllers	29	4	Offline & Open discussions
21.		Preliminaries–Mamdani and Sugeno inference methods	30	4	Offline & Open discussions
22.		Fuzzy sets in commercial products – basic construction of fuzzy controllers	31	4	Offline & Open discussions
23.		Basics of PI, PD, and PID Controllers	27	4	Offline & problem-solving based-learning
24.		Fuzzy PI, PD and PID controller	28	4	Offline & demonstration-based learning, learning through project, activity based
25.		Analysis of static properties of fuzzy controller,	29	4	Offline & demonstration-based learning
26.		Analysis of dynamic properties of fuzzy Controller.	30	4	Offline & Open discussions
27.		Simulation studies and case studies, Stability issues in fuzzy control.	31	4	Offline & activity-based learning
28.	**Unit 5**	Introduction to Genetic Algorithm (GA).	32-33	5	Offline & Open discussions
29.		Neuro-Fuzzy based hybrid system design.	34-35	5	Offline & open discussions
30.		Fuzzy-GA based hybrid system design.	36-37	5	Offline & Open discussions

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
--	63%	6%	2%	18%	--	11%	--

13-01-2025

Dr. Deepak Batham