19ES1401

AI Tools

Offering Branches	CSE,CE,ME		
Course Category:	Engineering Sciences	Credits:	2
Course Type:	Theory	Lecture-Tutorial-Practical:	2-0-0
Prerequisites:	**Mathematics –** Calculus , Statistics, Probability, Graph Theory	Continuous Evaluation:	30
	Programming Languages – C, C++, Java or Python	Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Understand** the fundamental concepts of Artificial Intelligence, Machine Learning and Deep Learning**.**	**L2**
CO2	**Apply M**achine learning concepts for real life Problems.	**L3**
CO3	**Apply** Deep Learning concepts to solve various problems.	**L3**
CO4	**Analyze** various machine learning methods to implement applications in different domains with an effective report.	**L4**

Course Content

UNIT-1	**Introduction to Artificial Intelligence:** What is AI, Foundations of AI, Goals of AI, and Applications of AI.	**CO1**
UNIT-2	**Machine Learning: Definition, Learning Methods:** Supervised Learning, Unsupervised Learning, Semi-Supervised Learning, Reinforcement Learning.	**CO1,CO2**
UNIT-3	**Machine Learning Applications:** Computer vision, Speech Recognition, Natural Language Processing, Decision Making process.	**CO1,CO2, CO4**

UNIT-4	**Deep Learning:** Basics of Deep Learning, Machine Learning vs Deep Learning, Fundamental Deep Learning Algorithm-Convolution Neural Network (CNN).	**CO1,CO3**
UNIT-5	**Deep Learning Applications:** Computer vision, Speech Recognition, Natural Language Processing, Decision Making process.	**CO1,CO3**

Learning Resources

Text Books

1. Artificial Intelligence: A Modern Approach, Stuart Russell and Norvig, Third Edition, 2015, Pearson Education. **(Unit-1)**

2. Machine Learning: A Probabilistic Perspective, Kevin P. Murphy, 2012, MIT Press **(Unit-2&3)**

3. Deep Learning (Adaptive Computation and Machine Learning series), Ian Goodfellow , Yoshua Bengio, Aaron Courville, Francis Bach, 2017, MIT Press. **(Unit-4&5)**

e-Resources & other digital material

1. https://swayam.gov.in/nd1_noc19_cs52/preview

2. https://swayam.gov.in/nd1_noc19_cs85/preview

3. https://emerj.com/ai-sector-overviews/machine-learning-healthcare-applications/

Course Coordinators: **(Dr. A Jaya Lakshmi)**

1. Dr. J Rama Devi   Prof. & Head, Dept. of CSE

2. Dr. G Lalitha Kumari

3. Mrs. Y Surekha

19ES1401

AI Tools-Micro Syllabus

Offering Branches	CSE,CE,ME		
Course Category:	Engineering Sciences	Credits:	2
Course Type:	Theory	Lecture-Tutorial-Practical:	2-0-0
Prerequisites:	**Mathematics –** Calculus , Statistics, Probability, Graph Theory	Continuous Evaluation:	30
	Programming Languages – C, C++, Java or Python	Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Understand** the fundamental concepts of Artificial Intelligence, Machine Learning and Deep Learning.	**L2**
CO2	**Apply M**achine learning concepts for real life Problems.	**L3**
CO3	**Apply** Deep Learning concepts to solve various problems.	**L3**
CO4	**Analyze** various machine learning methods to implement applications in different domains with an effective report.	**L4**

Course Content

UNIT-1	**Introduction to Artificial Intelligence:** ➢ **What is AI:** ▪ Acting humanly: The Turing Test approach ▪ Thinking humanly: The cognitive modelling approach ▪ Thinking rationally: The "laws of thought" approach ▪ Acting rationally: The rational agent approach ➢ **Foundations of AI:** ▪ Philosophy, Mathematics, Economics, Neuroscience, Psychology, Computer engineering, Control theory and	CO1

	cybernetics, Linguistics. ➤ **Goals of AI** ➤ **Applications of AI.**	

UNIT-2	**Machine Learning:**
	➤ **Definition**
	    ▪ Why Machine Learning
	    ▪ Types of Machine Learning
	➤ **Learning Methods:**
	    ▪ **Supervised Learning**: Definition
	        o **Types of Supervised Learning:** Classification and Example, Regression.
	    ▪ **Unsupervised Learning**: Definition,
	        o Discovering Clusters
	        o Discovering Latent Factors
	        o Discovering Graph Structure
	        o Examples
	    ▪ **Semi-Supervised Learning:** Definition, Example
	Reinforcement Learning: Definition, Example
		CO1,CO2

UNIT-3	**Machine Learning Applications**: ➤ **Computer vision**: Introduction, Pre-processing and Example ➤ **Speech Recognition**: Introduction and Example ➤ **Natural Language Processing**: Introduction and Example **Decision Making process**: Introduction and Example	**CO1,CO2,** **CO4**
UNIT-4	**Deep Learning:** ➤ Basics of Deep Learning ➤ Machine Learning vs Deep Learning ➤ Fundamental Deep Learning Algorithm-Convolution Neural Network (CNN). ➤ The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior.	**CO1,CO3**

| UNIT-5 | **Deep Learning Applications:**

➤ **Computer vision:** Introduction and Example

➤ **Speech Recognition:** Introduction and Example

➤ **Natural Language Processing:** Introduction and Example

➤ **Decision making process:** Introduction and Example | **CO1,CO3** |

Learning Resources

Text Books

4. Artificial Intelligence: A Modern Approach, Stuart Russell and Norvig, Third Edition, 2015, Pearson Education. **(Unit-1)**

5. Machine Learning: A Probabilistic Perspective, Kevin P. Murphy, 2012, MIT Press

   (Unit-2&3)

6. Deep Learning (Adaptive Computation and Machine Learning series), Ian Goodfellow , Yoshua Bengio, Aaron Courville, Francis Bach, 2017, MIT Press. **(Unit-4&5)**

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6. https://emerj.com/ai-sector-overviews/machine-learning-healthcare-applications/

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