Course Structure

A7702 - AI Tools

Branches for which this course is offered:			CSE(AI&ML), AI&ML, AI&DS					
Hours Per Week			Hours Per Semester			Credits	Assessment Marks	
L	T	P	L	T	P	C	CIE	SEE	Total
3	0	0	42	0	0	3	30	70	100

1. Course Description

Course Overview

The term "Artificial Intelligence (AI)" has become ubiquitous in everyday applications from virtual assistants to self-driving cars. Several applications such as Healthcare, Finance, Bioinformatics etc. are benefitting from the advances in the domain. This course introduces the fundamentals of Artificial Intelligence , Machine Learning and its Algorithms , Digital Image Processing , Natural Language Processing and Chatbots.

Course Pre/co-requisites

The course has no specific prerequisite and co requisite.

2. Course Outcomes (COs)

After the completion of the course, the student will be able to:

A7702.1 Identify the need and applications of artificial intelligence in real time.
A7702.2 Select a specific machine learning algorithm for a given problem.
A7702.3 Identify the applications, processing steps and components of image processing.
A7702.4 Choose different applications of AI using natural language processing.
A7702.5 Identify the requirements for chatbots in daily life.

3. Course Syllabus

Introduction to Artificial intelligence: Definition of AI, Why AI? Difference between Symbolic and Non-symbolic Representation,Research Focuses of Artificial Intelligence, History of AI: Turing Test, Chinese Room, Applications of AI: Natural Language Processing, Intelligent Retrieval from Databases,Expert Systems,Theorem Proving,Robotics, Combinatorial and Scheduling Problems,Perception Problems, Neural Architectures,Game Playing, Objectives of AI,Artificial Intelligence Programming, Criticism of AI, Future of AI.

Machine Learning: What is Human Learning, Types of Human Learning:Learning under expert guidance, Learning guided by knowledge gained from experts, Learning by self, What is Machine Learning:How do machines learn?, Well-posed learning problem,Types of Machine Learning: Supervised learning, Unsupervised learning, Reinforcement learning, Comparison – supervised, unsupervised, and reinforcement learning.Applications of Machine Learning: Banking and finance, Insurance, Healthcare, Tools in Machine Learning, Issues in Machine Learning.

Digital Image Processing: Digital Image Processing,The Origins of Digital Image Processing, Examples of Fields that use Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

Natural Language Processing: Overview of NLP The Components of NLP, Enterprise Applications of NLP, How to Use NLP, Challenges of NLP,Language Structure and Language Analyzer: Introduction to Language Structure,Overview of Language Analyzer: Morphological Analyzer, Local Word Grouper, Core Parser,Requirements of Computational Grammers: Computational Aspect, Systems Aspect, Large System Aspect.

Chatbots: What is a Chatbot? The Rise of Chatbots, How to build a Chatbot, Challenges of Building a Successful Chatbot, Best Practices, Industry Case Studies:Autodesk: Customer Support, Staples: Conversational Commerce.

4. Books and Materials

Text Books:

1. Rajendra Akerkar., Introducion to Artifical Intelligence, PHI, 2nd Edition, 2014
2. GAmit Kumar Das Saikat Dutt, Subramanian Chandramouli., Machine Learning, Pearson India Education Services, 2019.
3. Rafael C Gonzalez, Richard E.Woods., Digital Image Processing, Pearson Education,3rd Edition 2009.
4. Akshar Bharati, Vineet Chaitanya, Rajeev Sangal., Natural Language Processing: A Paninian Perspective, Prentice-Hall, India,2012.
5. Tom Markiewicz & Josh Zheng., Getting started with Artificial intelligence, Published by O'Reilly Media, 2017

Reference Books:

1. Stuart J. Russell and Peter Norvig., Artificial Intelligence A Modern Approach, 2002
2. Manas Kamal Bhuyan., Computer Vision and Image Processing Fundamentals and Applications, CRC Press, 2019