

# INT404:ARTIFICIAL INTELLIGENCE

L:3 T:1 P:0 Credits:4

**Course Outcomes:** Through this course students should be able to

CO1 :: define basic knowledge representation, problem solving, and learning methods of artificial intelligence.

CO2 :: understand approaches to syntax and semantics in NLP.

CO3 :: apply analytical concepts for solving logical problems using heuristics approaches.

CO4 :: develop AI learned concepts using python libraries.

## Unit I

**Introduction** : What is intelligence?, History of AI, applications of AI, branches of AI, defining intelligence using turing test, making Machine think like human, building rational agent, general problem solver, building an intelligent agent, problem spaces and search, problem characteristics, production system and its characteristics

## Unit II

**Search techniques** : search strategies, breadth first search, depth first search, generate and test, hill climbing, best first search, or graph, A\* algorithm, constraint satisfaction, coloring problem, relation problem

## Unit III

**Knowledge representation and reasoning** : knowledge based agents, knowledge representation techniques, propositional logic, predicate logic, clausal normal form, backward vs forward reasoning, introduction to logic programming, understanding the building blocks of logic, parsing a family tree

## Unit IV

**Natural Language Processing** : introduction to NLP, phases of NLP, construction of parse tree, tokenizing text data, word stemming, word lemmatization, dividing text data into chunks, bag of words model, spell checking algorithm, soundex

## Unit V

**Building games with AI** : using search algorithms in games, combinatorial search, minmax problem, alpha-beta pruning, negamax algorithm, last coin standing game, tic-tac-toe game, hexapawn game.

## Unit VI

**Advanced topics in Artificial Intelligence** : Types of Machine Learning, introduction to machine learning, activation functions, single neuron model, neural network architectures, genetic operators, genetic algorithm and its application, fuzzy logic, fuzzification and defuzzification, mamdani fuzzy inference system

## Text Books:

1. ARTIFICIAL INTELLIGENCE by KEVIN KNIGHT, ELAINE RICH, B. SHIVASHANKAR NAIR, MC GRAW HILL

## References:

1. ARTIFICIAL INTELLIGENCE: A MODERN APPROACH by STUART RUSSEL, PETER NORVIG, PEARSON
2. ARTIFICIAL INTELLIGENCE WITH PYTHON by PRATEEK JOSHI, PACKT PUBLISHING