1. Course Title	Fundamentals of AI
2. Credit Structure	Lecture hours per week: 3 Tutorial hours per week: 0 Practical hours per week: 2 Total Credits: 4
3. Course Code	XXX
4. Program/Semester	Btech
5. Category	Technical Elective / Open Elective
6. Prerequisite courses	Linear Algebra, Programming Required Basics of ML, Deep learning recommended
7. Foundation for	Advanced Deep learning, NLP, Computer Vision
8. Abstract Content	The course is aimed at providing a broad overview of the various paradigms of Artificial Intelligence. It will provide insights into approaches beyond the popular Machine learning models and delve into classic AI (search, planning, reasoning), Nature inspired AI (genetic algorithms, evolutionary AI) and generative AI (foundation models). We will also touch upon explainable AI nd fair AI.
Suggested Text book(s)	Artificial Intelligence: A modern Approach Stuart Russel and Peter Norvig

Detailed Course Contents		
Topic Name	**Content (2 -3 lines per 4 – 6 lectures)**	**No. of lectures**
1.	Philosophy of Learning - Core components of Intelligence – memory, planning, search - Contrast between biological intelligence and AI	3
1.	Classic AI - Logic, Planning, Reasoning - A/A* Search Algorithms - Constraint Satisfaction Problem	9
2	Probability and Energy based models - Uncertainty and Bayesian Learning - Boltzmann Machines, Contrastive Divergence	6
3	Biologically Inspired and Reinforcement Models - Genetic Algorithms - Reinforcement Learning	6
4	Self-supervised Learning - Foundation models, LLMs, Attention models - Generative Models - Diffusion Models	9
5	Explainable and Fair AI	6
Outcomes and Objectives	Objective of the course are: - Broad exposure to cutting edge AI techniques beyond Neural networks and Deep learning - Getting a fair idea about strengths and limitations of state of art techniques - Demonstrations of AI techniques in real world applications - Exposure to contemporary societal problems arising due to explainability and fairness issues and approaches for designing systems that counter these issues	