

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-DSE1A

ELECTIVE-I(A): ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

III YEAR / V SEM

OBJECTIVES:

- To Acquire Knowledge on various AI Techniques and Expert Systems
- To have enriched knowledge regarding heuristic search, Knowledge representation and Expert systems

OUTCOMES:

- Gain a working knowledge of the foundations of and modern applications in, artificial intelligence heuristic search, knowledge representation and logic.

UNIT - I

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

UNIT - II

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.

UNIT- III

Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.

UNIT - IV

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

UNIT - V

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems- Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

TEXT BOOK:

1. Elaine Rich and Kevin Knight, Shiva Shankar Nair, “*Artificial Intelligence*”, McGraw-Hill Companies, 3rd edition.

REFERENCE BOOKS:

1. Stuart Russell & Peter Norvig , “*Artificial Intelligence A Modern Approach*”, Perason, 2nd Edition.
2. George F Luger , “*Artificial Intelligence*”, Pearson 2002, 4th Edition.
3. V S Janaki Raman, K Sarukesi, P Gopalakrishnan, “*Foundations of Artificial Intelligent and Expert Systems*”, MacMillan India limited.

WEB REFERENCES:

- NPTEL & MOOC courses titled Artificial Intelligence and Expert Systems
- <https://nptel.ac.in/courses/106106140/>
- <https://nptel.ac.in/courses/106106126/>