Search

- Problem solving by search: formalization
- Uninformed search: Breadth-First, Uniform-Cost, Depth-First, Depth-Limited, and Iterative- Deepening
- Heuristic search: Greedy best-first, A*
- Properties of search: completeness, optimality, time and space complexity
- Path/cycle checking
- Game tree search: MiniMax, alpha-beta pruning
- CSP: Formalization, backtracking, forward checking, and GAC algorithms

Knowledge representation and reasoning

- First-order logic: syntax and semantics
- Soundness and completeness of proof procedures
- Converting first-order formulas into clausal form
- Unification and MGU
- Refutation proof
- Answer extraction

Planning

- Closed world assumption
- STRIPS representation of actions
- STRIPS planning
- Relaxed plan heuristics

Reasoning under uncertainty

- Bayesian networks: graphs + tables
- Inference in Bayesian networks: computing posterior probabilities
  - Using product decomposition, summing out, and Bayes rules
  - Variable elimination
- Use D-separation to determine independence