- Uninformed Search
  - state space
  - successor function
  - fringe,open
  - queue/priority queue
  - Performance Measures
    * completeness
    * optimality
    * time complexity
    * space complexity
  - BFS
  - UCS
  - DFS
  - Iterative Deepening
  - Bidirectional Search

- Informed Search
  - heuristic
  - Best First Greedy Search
  - A Search
  - A* Search
  - admissible heuristic
  - IDA*
  - Beam Search

- Local Search
  - Hill Climbing
  - local/global optima
  - Simulated Annealing
  - Genetic Algorithms
    * crossover
    * mutation

- Game Playing
  - 2-Player Zero-Sum Discrete Finite Deterministic Game with Perfect Information
  - game theoretic value
  - Minimax algorithm
  - Alpha-Beta Pruning
  - ... Non-Deterministic ...

- Constraint Satisfaction Problems
  - variables, values, constraints
  - CSP as graph
  - Backtracking Search
  - variable/value choice heuristics
  - Forward Checking
  - Constraint Propagation
  - Arc Consistency

- Machine Learning
  - Instances
  - Features
  - Feature Vector/Feature Space
  - Distance Metrics
    * Euclidean Distance/$\ell 2$ norm
    * Manhattan Distance/$\ell 1$ norm

- Unsupervised Learning
  - Clustering
  - HAC
    * Single/Complete/Average Linkage
  - k-Means
    * Distortion
    * Stopping Condition

- Supervised Learning
  - Labels
  - Classification/Regression
  - kNN
  - Evaluation/Performance Measures
  - Train/Tune/Test Set
  - Overfitting/Generalization
  - Perceptrons
    * Activation Function
    * Bias term
    * Linear Perceptron
    * Linear Threshold Unit
    * Gradient Descent
    * Learning Rate
    * Step Function
    * Sigmoid Function
    * Linear Separability

- Neural Networks
  * Hidden Layer
  * Feed Forward-Back Propagation
  * Epoch
- SVMs
  * Margin
  * Constrained Optimization
  * Support Vectors
  * Linearly Non-Separable Data
  * Slack
  * Primal/Dual Representation
  * Kernels
- Decision Trees
  * Internal/Leaf Nodes
  * Entropy
  * Conditional Entropy
  * Mutual Information
  * Pruning
  * Real-Valued Features and DTs

- Probability
  - Sample Space
  - Random Variable
  - Axioms of Probability
  - Joint Probability
  - Marginal Probability
  - Conditional Probability
  - Chain Rule
  - Logical vs. Statistical Inference
  - Bayes Rule
  - Independence
  - Conditional Independence
  - Bayesian Network
  - Joint Probability Table
  - DAG
  - CPT
  - Parents/Children
  - Naive Bayes Classifier

- Speech Recognition
  - Language/Acoustic Models
  - 1st Order Markov Assumption
  - 1st Order Markov Model
  - Hidden Markov Model

- Propositional Logic (PL)
  - terminology
  - truth tables
  - inference by enumeration
  - logical equivalences
  - natural deduction proofs
  - Conjunctive Normal Form (CNF)
  - Resolution rule

- First Order Logic
  - issue with PL
  - Universal Quantifier
  - Existential Quantifier