CSCI 446 – ARTIFICIAL INTELLIGENCE
EXAM 2 STUDY OUTLINE

Uncertainty

I. Uncertainty
- A. Sources of Uncertainty
- B. Methods for Handling Uncertainty

II. Probability
- A. Terms
  - 1. Sample Space
  - 2. Event
  - 3. Random Variables
  - 4. Propositions

III. Syntax and Semantics
- A. Prior Probability
- B. Joint Probability
- C. Conditional Probability

IV. Inference
- A. Enumeration
  - 1. Normalization

V. Independence
- A. Absolute
- B. Conditional

VI. Bayes' Rule

Bayesian Networks

I. Syntax
- A. Nodes
- B. Directed Arcs
- C. Conditional Probabilities
- D. D-Separation

II. Semantics
- A. Global and Local
- B. Constructing a Bayes Net

III. Inference
- A. Enumeration
- B. Variable Elimination
  - 1. Factors

IV. Sampling
- A. Prior Sampling
- B. Rejection Sampling
- C. Likelihood Weighting
- D. Gibbs Sampling

Rational Decisions

I. Rational Preferences
II. Utility
    A. Assessment of Human Utility
III. Decision Networks
    A. Decision Node
    B. Chance Node
    C. Utility Node
IV. Value of Information

Machine Learning
I. Learning Agents
    A. Architecture
    B. Learning Element
    C. Supervised/Unsupervised Learning
II. Inductive Learning
    A. Approximate f(x) with h(x)
    B. Overfitting
    C. Generalization
    D. Structural Representations
        1. Decision Trees
        2. Rules
    E. Algorithms
        1. Decision Trees – Information Theory / Entropy
        2. Rules – Instance Covering