CMPT 310 - D100 Artificial Intelligence Survey

**Instructor(s):**  Jim Delgrande  
**SFU Burnaby**

**Calendar Objective/Description:**  
Provides a unified discussion of the fundamental approaches to the problems in artificial intelligence. The topics considered are: representational typology and search methods; game playing, heuristic programming; pattern recognition and classification; theorem-proving; question-answering systems; natural language understanding; computer vision.

**Instructor’s Objectives:**  
The goal of this course is to provide students with a survey of different aspects of artificial intelligence (AI). We will start with the AI-as-search paradigm, and discuss generic search strategies and heuristic-based improvements. Logic, in particular first-order logic, will be presented as a formalism for representing knowledge in AI systems. The use of probability as a mechanism for handling uncertainty in AI will be presented, with a focus on Bayesian networks. Finally, we will explore the design of AI systems which use learning to improve their performance on a given task. In addition to these topics, if time permits, other topics such as computer vision, natural language processing, and robotics will be addressed.

**Prerequisites:**  
CMPT 225 and (MACM 101 or ENSC 251 and ENSC 252). Students with credit for CMPT 410 may not take this course for further credit.

**Topics:**  
- Search  
- Logic  
- Constraint satisfaction problems  
- Game playing  
- Planning  
- Reasoning under uncertainty (probability)  
- Bayesian networks  
- Hidden Markov Models, Dynamic Bayesian networks  
- Utility theory, Decision networks  
- Learning

**Grading:**  
Grading will be announced the first week of class. Evaluation will be based on four programming and written assignments as well as a midterm and final exam.

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

**Required Books:**  
Academic Honesty Statement::

Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).