SU DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SYLLABUS
COSC 411 – *Artificial Intelligence*

Description: Survey foundational topics in artificial intelligence. Study both exact and probabilistic learning and decision-making frameworks, deterministic and non-deterministic. Consider both historical and state-of-the art techniques using the Python languages. Discuss ethical and social concerns surrounding the use and development of artificial intelligence. Design agents to solve a wide array of problems, using knowledge representation, uncertainly, learning, and communication. Three lecture-hours per week.

Prerequisites: Grade of "C" or better in: COSC 320. COSC 311 recommended.
Required Text:

- *Artificial Intelligence, A Modern Approach* (3rd edition), by Stuart Russell and Peter Norvig

	Weeks
Introduction, Python Basics	***2.0***
Variables, expressions, functions, classes, library usage, I/O	
Search techniques, game playing	***2.0***
Uninformed search, heuristics, local search and optimization, adversarial search	
Automated proofs, knowledge representation	***2.0***
Propositional inference, planning and state-space search, hierarchical planning, multi-agent planning, ontology, categories, events, and objects	
Probabilistic Reasoning	***2.0***
Uncertainty, reasoning over time, utility functions, decision networks, policy iteration	
Machine Learning	***2.0***
Supervised learning, unsupervised learning, reinforcement learning, learning probabilistic models	
Communication and Perception	***2.0***
Natural language processing, image perception and reconstruction, robotics	
Ethics and Philosophy	***1.0***
Risks of AI, meaning of intelligent action, directions in AI	
Exams	***1.0***

EVALUATION

Homework, labs, class participation: 20-30%
Projects and presentations: 40-60%
Exams and quizzes: 20-40%

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.

1/2021