AIDI 1008: REINFORCEMENT LEARNING PROGRAMMING

Course outlines are reviewed annually as part of continual quality improvement. This course was last updated for the effective term below.

Effective Term
Summer 2021

Full Course Title
Reinforcement Learning Programming

Academic Level
Post Graduate

Subject Code
AIDI - PG Artifical Intelligence

Course Number
1008

Grade Mode
Numeric

PLAR Applicable
Yes

Total Hours
42

Course Description
Reinforcement learning utilizes software agents to make decisions in a simulated environment and use a reward/penalty system for achieving goals or making mistakes. Through numerous iterations of the simulation the algorithms learn and adjust in order to provide the best possible outcome. Students learn how to leverage reinforcement learning concepts such as dynamic programming, Q-learning, State-Action-Reward-State-Action (SARSA) and Deep Deterministic Policy Gradient (DDPG) to solve artificial intelligence problems that are highly dimensional.

Course Content
- Reinforcement learning principles
- Dynamic programming
- DQN (Deep Q-Network)
- Temporal difference learning
- Policy gradients

Course Evaluation

The passing grade for this course is 60%, evaluation is comprised of:
- Assignments 60%
- Test(s) 40%

Tests/examinations/assignments must be written/submitted at the time specified. Requests for adjustments to that schedule must be made before the test/exam/assignment date to the faculty member. Failure to do so will result in a mark of "0", unless an illness/ emergency can be proven with appropriate documentation at no cost to the College.

Academic Appeal
Students at Georgian College can appeal the following:
· A mark on an assignment, test, examination or work-integrated learning term
· Missing or incorrect assessment information on a grade report and/or transcript
· A charge of academic misconduct
Note: Students cannot appeal a final grade. It is the academic work that is appealable leading to the final grade i.e. final test, exam or assignment.

Refer to Academic Regulations 9.2 Academic Appeal for further details.

To graduate from graduate certificate level programs, a student must attain a minimum of 60% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester. The passing weighted average for promotion through each semester and to graduate is 60%.

Course Learning Outcomes

Upon successful completion of this course, the student has reliably demonstrated the ability to:

1. evaluate different reinforcement learning methodologies;

Evaluation

Introduced
Assessed

Upon successful completion of this course, the student has reliably demonstrated the ability to:

2. design a reinforcement learning system;

Evaluation

Introduced
Assessed

Upon successful completion of this course, the student has reliably demonstrated the ability to:

3. create a dynamic program to solve a complex problem;

Evaluation

Introduced
Assessed

Upon successful completion of this course, the student has reliably demonstrated the ability to:

4. apply a Deep Q-Network (DQN) to perform reinforcement learning;

Evaluation

Introduced
Assessed

Upon successful completion of this course, the student has reliably demonstrated the ability to:

5. design a rewards-based AI system using a policy gradient.

Evaluation

Introduced
Assessed

Key: 30163