

COURSE OUTLINE

ECE 569A – Selected Topics in Computer Engineering: Artificial Intelligence

Term –SUMMER 2021(202105)

Instructor

Dr. Deepali Arora

Phone:

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Office Hours

Days: Thursday

Time: 4:30-5:30 pm

[Location/Platform/link](#); Please email me beforehand

Course Objectives

- Introduce the fundamental concepts of Artificial Intelligence (AI).
- Expose students to different branches of AI and their practical applications.

Learning Outcomes

Understand the basic concepts of AI and the problem domains it is suitable for.

Analyze and formulate a given problem, and select the appropriate AI technique(s) to solve it.

Apply different AI techniques to solve real-world problems.

Evaluate the performance of AI techniques using standard metrics and benchmark datasets.

Enhance their computing skills by the use of Matlab/R/Python programming.

Syllabus

The course topics will be covered as follows.

Week 1: Introduction to AI

Introduction to AI

Introduction to Search Techniques in AI

Week 2 and 3: Search Techniques in AI

Uninformed Search

Informed Search

Local Search

Genetic Algorithms

Adversarial Search

Week 4 and 5: Knowledge and reasoning (constraint-satisfaction and logical formalisms for knowledge discovery)

Constrained Satisfaction Problems

Propositional Logic and Satisfiability

Propositional Logic for Planning

Week 6-8: Knowledge and reasoning (introduction to algorithms for logical inference, and planning)

Logical Agents 1 & 2

First Order Logics 1 & 2

Week 9:-10 Uncertainty (discussion on probabilistic reasoning and the formalism of Markov decision processes)

Markov Decision Processes 1 and 2

Hidden Markov Models

Week 11: Uncertainty (overview of Bayesian networks for modeling uncertainty)

Bayesian Networks Machine Learning

Week 12-13: AI applications (AI's applications in natural language processing, and deep learning)

Deep Learning

Applications in NLP

A-Section(s):

Section A01 CRN: 31910

Section A02 CRN: 31911

Optional Text

Title: Artificial Intelligence: A Modern Approach

Author: Stuart Russell and Peter Norvig

Publisher: Prentice Hall

Year: 2010

hours after discussing with the class. You can also contact me through e-mail for appointments.

Office Hours

Online office hours will use Zoom. I'll post time slots for office hours after discussing with the class. You can also contact me through e-mail for appointments.

Tools required:

- Desktop or Laptop Computer with webcam/microphone/speakers/headsets for online lecture & tutorials (worst case a smartphone will do)
- Scanner (desktop or phone-based)
- Printer (useful but not mandatory)
- Software installed on your computer:
 - Web browser to be able to access/run Zoom, CourseSpaces, etc.
 - Pdf viewer
 - Excel, Word, etc might be useful as well

Please make yourself familiar with Zoom, which we will use for live interaction in tutorial, office hours, etc:

<https://www.uvic.ca/systems/services/avmultimedia/zoomvideoconferencing/index.php>

Assessment

Assessment	Weight	Date
1. Three assignments (10% each)	30%	May 18, 2021 (first assignment), June 8, 2021 (second assignment), July 5, 2021 (third assignment)
2. Mid-term	20%	June 15, 2021
3. In-class quiz	10%	July 13, 2021
4. Project	40%	Proposal due (May 18, 2021), midterm project review (June 22, 2021), final project (July 19, 2021)

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Graduate Calendar.

<https://www.uvic.ca/calendar/archives/202105/grad/#/policy/B13jeiMdE?bc=true&bcCurrent=07%20-%20Grading&bcltemType=policies>

Important: All deadlines and schedules for this course will reference Pacific Daylight Time.

Note to Students:

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

Course Withdrawal Deadlines:

- **May 20, 2021: Withdrawal with 100% reduction of tuition fees**
- **June 6, 2021: Withdrawal with 50% reduction of tuition fees**
- **July 1, 2021: Last day for withdrawal (no fees returned)**

Accommodation of Religious Observance:

<https://www.uvic.ca/calendar/archives/202105/grad/#/policy/SkmigiMOV?bc=true&bcCurrent=17%20-%20Accommodation%20of%20Religious%20Observance&bcltemType=policies>

Policy on Inclusivity and Diversity:

Engineering: <https://www.uvic.ca/engineering/about/equity/index.php>

Academic Calendar:

<https://www.uvic.ca/calendar/archives/202105/grad/#/policy/HkQ0pzdAN?bc=true&bcCurrent=General%20University%20Policies&bcGroup=%20General%20University%20Policies&bcltemType=policies>

Standards of Professional Behaviour:

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.

<http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Academic Integrity:

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Graduate Calendar for the UVic policy on academic integrity.

<https://www.uvic.ca/calendar/archives/202105/grad/#/policy/BJujesME?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20integrity&bcltemType=policies>

Equality:

This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building:

<https://www.uvic.ca/services/cal/>. The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Course Lecture Notes:

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

Sexualized Violence Prevention and Response at UVic:

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support, please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: www.uvic.ca/svp

Office of the Ombudsperson:

The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca, Website: <https://uvicombudsperson.ca/>