



## Introduction to Artificial Intelligence and Machine Learning

### 1.0 Course Faculty Information

Prof. Dr. V. Saranya

Instructor

NSRIC Inc.,

London, Ontario, Canada

### 2.0 Course Information

Course Code and Title	<b>NSRIC T0001: AI&amp;ML</b>
Month Year	July 2023
Class Days	Monday - Friday
Class Time	10:00 am – 11:00 am EST
Course Credit Hours	3
Class Location	NSRIC online platform
prerequisites and/or co-requisites	N/A
Level /A, E, H, I, K12, M, P, S, T, U, V, W	Foundational courses /I,P

**Note:** The below classification of courses is related any areas of knowledge:

**A:** Advanced level academic level courses; **E:** Executive courses; **H:** Higher-level courses (i.e., graduate courses); **I:** Intermediate courses (i.e., university preparatory courses – Grade XII+); **K12:** Foundational, and lower-level courses; **M:** Mid-level courses (i.e., undergraduate courses); **P:** Professional courses; **S:** Short/seminar courses; **T:** Training courses; **U:** Tutorial Courses; **V:** Vocational training courses; and **W:** Workshop courses.

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## 3.0 Professor Information

Name	Dr.V.Saranya
Title	NSRIC
Contact Information	<a href="mailto:saranyapulse@gmail.com">saranyapulse@gmail.com</a>
Office Location	NSRIC online platform
Office Hours	10: 30 am – 11:30 am EST (Saturdays) by email appointment

## 4.0 Target Audiences

- Diploma and vocational training student
- University undergraduate level student
- Any student who is interested in Artificial Engineering and Machine Learning
- Students who want to know Basics of Artificial Engineering and Machine Learning offered by Dr. V. Saranya

## 5.0 Course Description

This course is designed for the audiences who want to learn about Artificial Intelligence (AI) and Machine Learning (ML) as rapidly evolving fields that have transformed the world, we live in. AI refers to the ability of machines to perform tasks that normally require human intelligence, such as reasoning, perception, and decision making. ML, on the other hand, is a subset of AI that focuses on the ability of machines to learn from data without being explicitly programmed. A foundational course in AI and ML typically covers the fundamental concepts, theories, and algorithms that underlie these fields. Students will learn about various types of machine learning, including supervised, unsupervised, and reinforcement learning. They will also study key topics such as neural networks, deep learning, natural language processing, and computer vision. In addition, the course may cover practical applications of AI and ML,

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such as image and speech recognition, autonomous vehicles, and recommender systems. Students will have the opportunity to work on hands-on projects to develop their skills in building and evaluating machine learning models. By the end of the course, students should have a solid understanding of the key concepts and techniques in AI and ML, as well as their applications and potential impact on society. They should also be able to apply their knowledge to solve real-world problems using machine learning techniques by Prof. Saranya. V at NSRIC Platform to understand this course content.

## 6.0 Course Learning Outcomes

Upon successful completion of this course, students will be able to:

CLO1: Understand the basic principles of artificial intelligence and machine learning, including the difference between supervised and unsupervised learning, and the concept of deep learning.

CLO2: Analyse and interpret data using statistical methods and machine learning algorithms.

CLO3: Build and train basic machine learning models, such as linear regression and decision trees, using Python and popular machine learning libraries such as scikit-learn.

CLO4: Evaluate the performance of machine learning models and choose appropriate metrics for specific problems.

CLO5: Understand the ethical and social implications of AI and ML, including issues related to bias, fairness, and transparency.

CLO6: Identify potential applications of AI and ML in various industries and domains, such as healthcare, finance, and e-commerce.

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## 7.0 How the course supports the attainment of the student outcomes

Student Learning Outcomes (1-6)					
1	2	3	4	5	6
Moderate	Moderate	Moderate	Low	Moderate	Moderate

## 8.0 Course Materials

### Online course materials

- Online PowerPoint presentation slides in pdf form
- Audio/visual recording of lectures (Optional)
- Online tutorial and meeting with students upon request
- Assignments and quizzes in the MLS system in pdf form
- Reading materials if any in pdf form

### Textbook and resources (If any)

- 1) Machine Learning for Dummies, 2nd Edition. John Paul Mueller, Luca Massaron. ISBN: 978-1-119-72401-8
- 2) Artificial Intelligence: A Modern Approach, 3rd Edition; Format, Cloth; ISBN-13: 9780136042594.

## 9.0 Academic Integrity

Students are encouraged to have a look at the NSRIC’s statement of academic integrity at NSRIC website. It is noted that by signing this syllabus, you will acknowledge that you have understood that any detected plagiarism should be reported.

## 10. Assessment for Grade

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This course contains assignment and quizzes for assessment. Student will receive a “Certificate of completion” after successful completion of the course.

## Important Note:

- i) The below classified courses (i.e., academic courses) will only be evaluated based on the grade system shown in Table 2. A grade and certificate will be issued for the student(s) and participant(s).

**A:** Advanced level academic level courses; **H:** Higher-level courses (i.e., graduate courses); **I:** Intermediate courses (i.e., university preparatory courses – Grade XII+); **K12:** Foundational, and lower-level courses; **M:** Mid-level courses (i.e., undergraduate courses).

- ii) The below classified courses will **not** be evaluated based on the grade system shown in Table 2. A certificate will be issued for the student(s) and participant(s).

**E:** Executive courses; **P:** Professional courses; **S:** Short/seminar courses; **T:** Training courses; **U:** Tutorial Courses; **V:** Vocational training courses; and **W:** Workshop courses.

## Participation/Engagement/Performance

Your participation in every aspect of the course is important for the learning process. Your engagement in every discussion in the course, due delivery of all assignments, quizzes, and research projects will be fruitful. These efforts from your side will reflect your performance in the course delivery and your commitments. This performance is the reflection of your dream grade!!

## Assignments

You will be given **1 assignment** during the course delivery. The due dates for assignments are specified in the course content and schedule section. The assignments will be given time

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to time to solve/answer during the term. Assignments will be posted through NSRIC online platform at least one week before they are due. Due dates are given in course schedule (tentative schedule). However, in case of any special circumstance, the date will be posted beforehand or announced in class.

## Quizzes

**A Maximum of 2** quizzes (maximum of **Two MCQ @ five minute**) will be taken based on class lectures and performance. The quiz will be taken in the beginning of the lecture through NSRIC online platform. If you miss the quiz without any valid official excuse, you will receive **zero** for the non-attended quiz. If any student fails to attend the quiz, he/she must submit a valid reason to the instructor. In such case, he/she should appear another quiz or may be averaged on the quizzes that he/she attended. It will depend on the situation and instructor.

## 11.0 Advice and additional requirements

### *I advise you to:*

- Please contact me if you need any help.
- Students are expected to attend all scheduled online lecture classes.
- Students are expected to study from the course materials and/or textbooks which will help to easily read and understand.
- Students are encouraged to write their own notes during lectures/presentations (pdf PowerPoint presentations, and additional materials if any).
- Students are encouraged to attend online platform classes on time because late-attende disrupts the flow of the class for both the instructor and the other students.

### ***Additional information (During Online Course offering Period)***

- The PowerPoint course materials, and video lectures will be available at the NSRIC Platform.

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- There will be scheduled discussion/tutorial sessions on **every Monday** at the class scheduled time. All students must attend this session (Need student request).
- There will be an office hours for students on Monday from 10:30 am – 11:30 am, Toronto, Canada time. Students need to send an email request so that a zoom meeting can be arranged. In addition, any time student can set up an online appointment (i.e., phone, zoom, and/or other mode of communications) based on availability of the course instructor. However, student should send an email request for setting up this type of meeting.

## 12.0 Course Topics

1. Introduction to Artificial Intelligence (AI) and Machine Learning (ML)
2. Mathematics for Machine Learning
3. Supervised Learning
4. Unsupervised Learning
5. Deep Learning
6. Reinforcement Learning
7. Natural Language Processing (NLP)
8. AI Ethics and Bias
9. Case Studies and Real-World Applications

## 13.0 Course Contents and Schedule

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Lec. No.	Module	Topics	Remarks
<b>Introduction to Artificial Intelligence and Machine Learning</b>			
1.	Introduction	Overview of AI and ML	
2.	Introduction	Introduction to Data in Machine Learning	
3.	Introduction	Types of AI	
4.	Introduction	Types of ML	Quiz 1
5.	Introduction	Applications of AI and ML	
6.	Introduction	Introduction to Python programming	
7.	Introduction	Control Structures in Python	Assignment 1
8.	Introduction	Best Python libraries for Machine Learning	
9.	Introduction	Installation and simple problems in python	
10	Revision	Summery	Quiz 2

**Prepared** by Dr. V. Saranya, OE Division, NSRIC Inc., London, ON, Canada.

## Course Descriptions

Artificial Intelligence (AI) and Machine Learning (ML) are two of the most exciting and rapidly growing fields in computer science today. This module provides an introduction to these topics, covering key concepts, techniques, and applications of AI and ML. The module begins with an overview of AI and its various subfields, including machine learning, natural language processing, robotics, and more. Additionally, it explores how to evaluate machine learning models, and how to use them to solve real-world problems using python.

**Captions:** Artificial Intelligence (AI), Machine Learning (ML), Python, AI and ML techniques and applications.

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## Requirements/Instructions

Students are advised to register all AI & ML modules courses for becoming the master in the subject area.



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