Course Objective and Outcome Form

Department of Electrical and Computer Engineering
School of Engineering and Physical Sciences
North South University, Bashundhara, Dhaka-1229, Bangladesh

1. **Course Number and Title:** CSE445 Machine Learning

2. **Number of Credits:** 3 Credits

3. **Type:** Required, Engineering, Lecture

4. **Prerequisites:** CSE332 Computer Architecture and Organization

5. **Contact Hours:** Lecture – 3 Hours/Week
6. **Instructor:** Dr. Mohammad Abdul Qayum
Faculty initial: MAQm
Office: SAC 1044A
Email: mohammad.qayum@northsouth.edu
Office Hour: See instructor's schedule at canvas
(Open door policy)

7. **Class Time:** **Section 4:** MW 11:20 AM 12:50 PM

8.

9. **Classroom:** **Section 4:** SAC 502 (Theory)

10. **Course Summary:**

Introduction to Machine Learning; Classification of learning: Unsupervised and supervised learning, Connectionist learning, Reinforcement learning, Machine discovery; Supervised learning: Information theoretic decision tree learner, Best current hypothesis search, Candidate elimination (version space) algorithm, Learning in the first order Horn clause representation, Inductive logic programming, Application; Unsupervised learning: Hierarchical clustering, Category utility, Incremental and non-incremental algorithms for hierarchical clustering, Applications; Connectionist learning: Introduction to Neural Network, Feedforward and recurrent network, Perceptron, Multilayer feedforward network, Backpropagation algorithm for training a feedforward network, Applications; Genetic Algorithms: Genetic operators, Fitness function, Genetic algorithm in supervised learning framework, Applications

10. Course Objectives:

The objectives of this course are –

a. To gain insights into the ML algorithms
b. To find the best solution to a problem using statistical analysis
c. To be able to implement an ML project

11. Course Outcomes (COs):

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

Sl.	CO Description	Weightage (%)
1	CO1: Gain insights into the ML algorithms	20%
2	CO2: Pick the best solution to a problem using mathematical analysis	30%
3	CO3: Implement an ML project efficiently	30%

12. Mapping of CO-PO:

Sl.	CO Description	POs	KP	Bloom's taxonomy domain/level	Delivery methods and activities	Assessment tools
CO1	**gain** insights into the ML algorithms	**a**	K4	Cognitive/ Understand	Lectures	(Mid/Final)
CO2	**find** the best solution to a problem using statistical analysis	**a**	K4	Cognitive/ Apply	Lectures	(Mid/Final/ Project)
CO3	**implement** an ML project efficiently	**e**	K6	Psychomotor/ Precision	Lectures	(Project)

13. Resources

Text books:

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Aurelien Geron	2017	Hands-on Machine Learning with Scikit-Learn, Keras, & TensorFlow	2nd	O'Reilly Media	978-1492032649

Reference books:

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Sebastian Raschka, Yuxi (Hayden) Liu, Vahid Mirjalili	2022	Machine Learning with PyTorch and Scikit-Learn: Develop machine learning and deep learning models with Python	1st	Packt Publishing	978-1801819312
2	Christopher Bishop	2006	Pattern Recognition and Machine Learning	1st	Springer	978-0387310732
3	Jerome Friedman	2009	The Elements of Statistical Learning: Data Mining, Inference, and Prediction	2nd	Springer	978-0387848570

Software resources:

Jupyter Notebook/Google Co-Lab
Python
Windows Command-line or Ubuntu Bash

11. Weightage Distribution among Assessment Tools: Tentative

Total: Attendance – 5%,
Impromptu Quizzes/Assignment/Homework – 20%
Mid Term – 25%,
Final Term– 25%,
Final Project – 25%

12. Grading policy: As per NSU grading policy available in

http://www.northsouth.edu/academic/grading-policy.html