

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

DATA 420 Advanced Data mining and machine learning

**Created by: Mehdi Ghayoumi
Updated by:**

**SCHOOL OF SCIENCE, HEALTH, & CRIMINAL JUSTICE
CYBERSECURITY DEPARTMENT
SPRING 2024**

- A. **TITLE:** Advanced Data mining and machine learning
- B. **COURSE NUMBER:** DATA 420
- C. **CREDIT HOURS:** 3
- D. **WRITING INTENSIVE COURSE:** n/a
- E. **GER CATEGORY:** n/a
- F. **SEMESTER(S) OFFERED:** Fall and Spring
- G. **COURSE DESCRIPTION:** This Course provides advanced topics in machine learning and data mining, including prediction, generating, and classification algorithms.
- H. **PRE-REQUISITES/CO-REQUISITES:**
- a. Pre-requisite(s): Data Mining and Machine Learning.

I. **STUDENT LEARNING OUTCOMES:**

<u>Course Student Learning Outcome [SLO]</u>	<u>PSLO</u>	<u>ISLO</u>
Explain supervised learning with some examples		5
Explain unsupervised learning with some examples		5
Explain semi-supervised learning with some examples		5
Describe reinforcement Learning with some case studies		5
Describe Gaussian models with some case studies		5
Describe Reinforcement Learning with some case studies Gaussian models		5
Identify Kernels with some case studies Gaussian models		5
Identify Artificial Neural Networks with some case studies Gaussian models		5

KEY	<u>Institutional Student Learning Outcomes</u> [ISLO 1 – 5]
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. **APPLIED LEARNING COMPONENT:** Yes _____ No X _____

K. **TEXTS:**
Probabilistic Machine Learning: Advanced Topics
 by Kevin Patrick Murphy.
 MIT Press, 2023.

L. **REFERENCES:** n/a

M. **EQUIPMENT:** n/a

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Participation Assignments
- Challenge Assignments
- Quizzes
- Exams

P. **DETAILED COURSE OUTLINE:**

- A. Supervised learning
- B. Unsupervised learning
- C. Semisupervised learning
- D. Reinforcement Learning
- E. Gaussian models
- F. Kernels
- G. Artificial Neural Networks

Q. **LABORATORY OUTLINE:**

n/a