The University of Jordan

Accreditation & Quality Assurance Center

Machine Learning and Neural Networks (1905370)

Fall 2022-2023

COURSE Syllabus

1	Course title	Machine Learning and Neural Networks
2	Course number	1905370
3	Credit hours (theory, practical)	3 theory
	Contact hours (theory, practical)	3 theory
4	Prerequisites/corequisites	**Data Mining 1915222**
5	Program title	Data Science
6	Program code	5
7	Awarding institution	The University of Jordan
8	Faculty	King Abdullah II for Information Technology
9	Department	Artificial Intelligence
10	Level of course	3rd Year
11	Year of study and semester (s)	Any
12	Final Qualification	Bachelor (B.Sc.)
13	Other department (s) involved in teaching the course	none
14	Language of Instruction	English
15	Date of production/revision	10-9-2022
16	Required/ Elective	Required

17. Course Coordinator:

Instructor	Office hours	Office Phone	E-Mails
Dr. Ali Rodan	Mon 2:00-3:00	22631	a.rodan@ju.edu.jo

18. Course Description:

This course is an introduction to Machine Learning and neural networks models where both theoretical and practical issues being considered. Upon completion of this course, the student should understand the main machine learning and neural network architectures and learning algorithms and be able to apply Machine learning and neural networks to real problems. Weekly lab session.

19. Course aims and outcomes:

A- Aims:

This course is intended to give AI and DS students an overview of Machine learning and neural networks topics. At the course completion, students will understand the fundamentals of Machine learning and neural networks and they will be able to evaluate MLNN techniques to be used for certain applications.

B- Intended Learning Outcomes ((Mapped directly to KPI ➔ ILO≡KPI):

Upon successful completion of this course students will be able to …

B1: To provide an understanding on different concepts related to machine learning and neural networks models and its training algorithms [SO 1]

B2: To develop a basic understanding of principles of learning theory, theoretical and mathematical foundations of machine learning [SO 1]

B3: To understand the concept of problem solving as recognition and learn how to use various Machine leaning tools. [SO 2]

B4: To Combine and modify machine learning methods to analyze practical dataset and convey the results. [SO 2]

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction to Machine Learning (ML)	1	Ali Rodan	B1	Exams	E-learning portal
ML Model Selection and Perceptron learning	1	Ali Rodan	B1,B2	Assignments, Exams	E-learning portal
Estimating Probabilities and Statistical learning	2	Ali Rodan	B2	Assignments, Exams	E-learning portal
Linear and logistic regression	1	Ali Rodan	B2	Assignments, Exams	E-learning portal
Neural Networks	3	Ali Rodan	B3	Homeworks, Exams	E-learning portal
Support vector Machine	1	Ali Rodan	B3, B4	Homeworks, Exams	E-learning portal
Ensemble Learning	1	Ali Rodan	B3	Exams	E-learning portal
Bayesian Networks	1	Ali Rodan	B3,B4	Assignments, Exams	E-learning portal
Reinforcement Learning	2	Ali Rodan	B1,B3	Assignments, Exams	E-learning portal
Self-Organizing Maps	1	Ali Rodan	B2,B4	Assignments, Exams	E-learning portal
Introduction to deep learning	1	Ali Rodan	B3,B4	Assignments, Exams	E-learning portal

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Method	Lecture	Demo	Laboratory	Case study
Learning outcomes	B1+B2+B3	B2,B3, B4	B3+B4	B2+B3+B4
Assessment	Exams + Assignment	Exams + Assignments	Project + Presentation	Exams + presentation

22. Evaluation Methods and Course Requirements:

Midterm Exam	30 marks.
HWs and Project	20 marks.
Final Exam	50 marks.

23. Course Policies:

A- Attendance policies:

Students are responsible for class attendance and for all material covered in class. It is the students' responsibility to turn in their homework assignments to their instructors by the announced due date/time.

The students are allowed to have no more than 15% absence of the whole number of lectures in the semester.

B- Absences from exams and handing in assignments on time:

Any absence for the exams is not acceptable unless a strong excuse is given and accepted by the lecturer then a makeup exam will be held

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

F- Available university services that support achievement in the course:

24. Required equipment:

Python, Jupyter Notebook

25. References:

A- Required book (s), assigned reading and audio-visuals:
Introduction to Machine Learning (2014) Ethem Alpaydim, Publisher: MIT press, Edition: 3rd
Recommended books, materials, and media:

26. Additional information:

TBD

Name of Course Coordinator: ----------Signature: ---------- Date: ----------

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File