S Y L L A B U S

<table>
<tr><td rowspan="8">General information</td><td>Title and code of subject, number of credits</td><td colspan="3">CMS 560 - Machine Learning</td></tr>
<tr><td>Department</td><td colspan="3">Computer Science & Engineering</td></tr>
<tr><td>Program</td><td colspan="3">M.S.c. - 4 credits</td></tr>
<tr><td>Academic semester</td><td colspan="3">Spring, 2023</td></tr>
<tr><td>Lecturer</td><td colspan="3">Behnam Kiani</td></tr>
<tr><td>E-mail:</td><td colspan="3">bkiani@khazar.org</td></tr>
<tr><td>Phone number:</td><td colspan="3"></td></tr>
<tr><td>Lecture room/Schedule</td><td colspan="3">11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), Class room: N406</td></tr>
<tr><td></td><td>Consultations</td><td colspan="3"></td></tr>
<tr><td>Course language</td><td colspan="4">English</td></tr>
<tr><td>Type of the subject</td><td colspan="4">Major</td></tr>
<tr><td>Textbooks and additional materials</td><td colspan="4">1. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 3rd Edition, Released October 2022.
2. https://stanford.edu/~shervine/teaching/cs-229/cheatsheet-supervised-learning
3. Online resources: https://www.coursera.org/learn/machine-learning-with-python
4. Online resources: https://cs229.stanford.edu/ - CS229: Machine Learning</td></tr>
<tr><td rowspan="2">Teaching methods</td><td colspan="2">Lecture</td><td>15</td></tr>
<tr><td colspan="2">Group discussions at seminars</td><td>15</td></tr>
<tr><td rowspan="6">Assessment</td><td>Components</td><td>Date/ Deadline</td><td>Percent (%)</td></tr>
<tr><td>Project</td><td></td><td>30%</td></tr>
<tr><td>Attendance</td><td></td><td>5%</td></tr>
<tr><td>Activity</td><td></td><td>5%</td></tr>
<tr><td>Midterm Exam</td><td>Midterm Exam</td><td>25%</td></tr>
<tr><td>Final Exam</td><td>Final Exam</td><td>35%</td></tr>
<tr><td>Course description</td><td colspan="4">This course introduces the tools, techniques, and concepts of Artificial Intelligence. The course combines theoretical foundations with practical applications. Topics include problem solving, principles of knowledge representation and reasoning, and learning methods of artificial intelligence.</td></tr>
<tr><td>Course objectives</td><td colspan="4">The objective of the course is to present an overview of artificial intelligence (AI) principles and approaches. Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning.</td></tr>
<tr><td>Learning outcomes</td><td colspan="4">▪ By the end of the course students should:
▪ Be able to design a knowledge-based system
▪ Be familiar with terminology used in this topical area
▪ Have read and analyzed important historical and current trends in Internet of Things.</td></tr>
<tr><td>Rules (Educational policy and behavior)</td><td colspan="4">▪ Preparation for class
The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions.
Throughout the semester we will also have a large number of review sessions. These</td></tr>
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	review sessions will take place during the regularly scheduled class periods. ▪ **Withdrawal (pass/fail)** This course strictly follows grading policy of the School of Economics and Management. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. ▪ **Cheating/plagiarism** Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations. ▪ **Professional behavior guidelines** The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.

This program reflects the comprehensive information about the subject and information about any changes will be provided in advance.

Week	***Topics***	***Purpose***	***Lecture***
Week 1.	Introduction to Machine Learning	Introduction and Concepts	Chapter 01
Week 2.	KNN	Classification	Chapter 01
Week 3.	Decision Trees	Classification	Chapter 02
Week 4.	Practical Session	Python	Chapter 02
Week 5.	Random Forest	Classification	Chapter 03
Week 6.	Regression & Regularization	Regression	Chapter 05
Week 7.	Midterm Exam	Classification	Chapter 06
Week 8.	Logstic Regression-Practical Session	Python	Chapter 06
Week 9.	Support Vectore Machine	Classification	Chapter 06
Week 10	Clustring K-Meens	Classification	Chapter 07
Week 11	Dimensionality Reduction - PVC	Classification	Chapter 08
Week 12	Anomaly detection	Optimaization	Chapter 09
Week 13	Recommender Systems	Case Studies	Chapter 10
Week 14	Practical SessionUsing Spark	Python	Chapter 10
Week 15	Reinforcement Learning	Reinforcement Learning	Chapter 11

	Final exam		