Medicine			
Bachelor	TR-NQF-HE: Level 7	QF-EHEA: Second Cycle	EQF-LLL: Level 7

Course Introduction and Application Information

Course Code:	UNI220
Course Name:	Machine Learning and Data Science
Semester:	Spring Fall
Course Credits:	ECTS: 5
Language of instruction:	Turkish
Course Condition:	
Does the Course Require Work Experience?:	No
Type of course:	University Elective
Course Level:	Bachelor | TR-NQF-HE:7. Master`s Degree | QF-EHEA:Second Cycle | EQF-LLL:7. Master`s Degree
Mode of Delivery:	E-Learning
Course Coordinator:	Dr. Öğr. Üy. ALPER ÖNER
Course Lecturer(s):	Ferzat Anka
Course Assistants:	

Course Objective and Content

Course Objectives:	The aim of the course is to provide students with information on basic techniques and methods in artificial learning and to enable students to have the ability to use artificial learning methods in solving practical problems. At the same time, it is to understand the importance of machine learning in today's application areas.

Course Content:	Machine learning basic concepts and methods. Problem solving using machine learning; methods using and not using problem information. Data analysis, To examine various algorithms. To explain the importance of artificial intelligence methods in different fields with examples

Learning Outcomes

The students who have succeeded in this course;

1) • Recognize the problems that can be solved by machine learning methods.

2) • Understanding the importance of artificial intelligence in solving various problems

3) • Can choose the appropriate machine learning method for the given problem.

4) • Can solve the given problem with the appropriate machine learning method.

5) • Knows the ways of representing information, its advantages and disadvantages.

Course Flow Plan

Week	Subject	Related Preparation
1)	Machine learning history and philosophy	
2)	Basic concepts	
3)	Basic concepts-Intelligent Agents	
4)	Introduction to machine learning and problem solving and search algorithms	
5)	Expert systems and machine learning	
6)	Optimization methods in machine learning	
7)	Homework-Presentation	
8)	Homework-Presentation	
9)	Homework-Presentation	
10)	Data science and analysis	
11)	Machine learning	
12)	Data science and methods	
13)	Machine learning	
14)	Search algorithms and their importance (Definite, greedy, heuristic, meta-heuristic)	

Sources

Course Notes / Textbooks:	• Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Third Ed., Prentice Hall, 2010, • Michael Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems (3rd Edition) 3rd Edition • Vasif Nabiyev, Yapay Zeka: İnsan ve Bilgisayar Etkileşimi 4. Baskı • Yalçin Özkan, Veri Madenciliği Yöntemleri, Papatya, 2008 • Cemalettin Kubat, Matlab Yapay Zeka ve Mühendislik uygulamaları, Pusula, 2009 • İlker Arslan, R ile İstatistiksel Programlama, Pusula, 2020 • Zafer Demirkol, Herkes İçin Yapay Zeka, Genç Destek, 2021 • S.Nematzadeh et al. Rationalized Statistics for Biosciences Analysing bioinformatics data using the R, LAP Publishing, 2021
References:	• Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Third Ed., Prentice Hall, 2010, • Michael Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems (3rd Edition) 3rd Edition • Vasif Nabiyev, Yapay Zeka: İnsan ve Bilgisayar Etkileşimi 4. Baskı • Yalçin Özkan, Veri Madenciliği Yöntemleri, Papatya, 2008 • Cemalettin Kubat, Matlab Yapay Zeka ve Mühendislik uygulamaları, Pusula, 2009 • İlker Arslan, R ile İstatistiksel Programlama, Pusula, 2020 • Zafer Demirkol, Herkes İçin Yapay Zeka, Genç Destek, 2021 • S.Nematzadeh et al. Rationalized Statistics for Biosciences Analysing bioinformatics data using the R, LAP Publishing, 2021

Course - Program Learning Outcome Relationship

Course Learning Outcomes	**1**	**2**	**3**	**4**	**5**
Program Outcomes					
1) When Istinye University Faculty of Medicine student is graduated who knows the historical development of medicine, medical practices, and the medical profession and their importance for society.					
2) knows the normal structure and function of the human body at the level of molecules, cells, tissues, organs and systems.					
3) is capable of systematically taking an accurate and effective social and medical history from their patients and make a comprehensive physical examination.					
4) knows the laboratory procedures related to diseases; In primary care, the necessary material (blood, urine, etc.) can be obtained from the patient with appropriate methods and can perform the necessary laboratory procedures for diagnosis and follow-up or request laboratory tests.					
5) can distinguish pathological changes in structure and functions during diseases					

Course Learning Outcomes	1	2	3	4	5
from physiological changes and can Interpret the patient's history, physical examination, laboratory and imaging findings, and arrive at a pre-diagnosis and diagnosis of the patient's problem.					
6) knows, plans and applies primary care and emergency medical treatment practices, rehabilitation stages.					
7) can keep patient records accurately and efficiently, know the importance of confidentiality of patient information and records, and protects this privacy.					
8) knows the clinical decision-making process, evidence-based medicine practices and current approaches.					
9) knows and applies the basic principles of preventive health measures and the protection of individuals from diseases and improving health, and recognizes the individual and/or society at risk, undertakes the responsibility of the physician in public health problems such as epidemics and pandemics.					
10) knows the biopsychosocial approach, evaluates the causes of diseases by considering the individual and his / her environment.					
11) is capable of having effective oral and/or written communication with patients and their relatives, society and colleagues.					
12) knows the techniques, methods and rules of researching. It contributes to the creation, sharing, implementation and development of new professional knowledge and practices by using science and scientific method within the framework of ethical rules.					
13) can collect health data, analyze them, present them in summary, and prepare forensic reports.					
14) knows the place of physicians as an educator, administrator and researcher in delivery of health care. It takes responsibility for the professional and personal development of own and colleagues in all interdisciplinary teams established to increase the health level of the society.					
15) knows employee health, environment and occupational safety issues and takes responsibility when necessary.					
16) knows health policies and is able to evaluate their effects in the field of application.					
17) keeps medical knowledge up-to-date within the framework of lifelong learning responsibility.					
18) applies own profession by knowing about ethical obligations and legal responsibilities, prioritizing human values and with self-sacrifice throughout own					

medical life. **Course Learning Outcomes**	**1**	**2**	**3**	**4**	**5**

Course - Learning Outcome Relationship

No Effect	1 Lowest	2 Average	3 Highest

	Program Outcomes	Level of Contribution
1)	When Istinye University Faculty of Medicine student is graduated who knows the historical development of medicine, medical practices, and the medical profession and their importance for society.	
2)	knows the normal structure and function of the human body at the level of molecules, cells, tissues, organs and systems.	
3)	is capable of systematically taking an accurate and effective social and medical history from their patients and make a comprehensive physical examination.	
4)	knows the laboratory procedures related to diseases; In primary care, the necessary material (blood, urine, etc.) can be obtained from the patient with appropriate methods and can perform the necessary laboratory procedures for diagnosis and follow-up or request laboratory tests.	
5)	can distinguish pathological changes in structure and functions during diseases from physiological changes and can Interpret the patient's history, physical examination, laboratory and imaging findings, and arrive at a pre-diagnosis and diagnosis of the patient's problem.	
6)	knows, plans and applies primary care and emergency medical treatment practices, rehabilitation stages.	
7)	can keep patient records accurately and efficiently, know the importance of confidentiality of patient information and records, and protects this privacy.	
8)	knows the clinical decision-making process, evidence-based medicine practices and current approaches.	
9)	knows and applies the basic principles of preventive health measures and the protection of individuals from diseases and improving health, and recognizes the individual and/or society at risk, undertakes the responsibility of the physician in public health problems such as epidemics and pandemics.	
10)	knows the biopsychosocial approach, evaluates the causes of diseases by considering the individual and his / her environment.	

11)	is capable of having effective oral and/or written communication with patients and their relatives, society and colleagues.	
12)	knows the techniques, methods and rules of researching. It contributes to the creation, sharing, implementation and development of new professional knowledge and practices by using science and scientific method within the framework of ethical rules.	
13)	can collect health data, analyze them, present them in summary, and prepare forensic reports.	
14)	knows the place of physicians as an educator, administrator and researcher in delivery of health care. It takes responsibility for the professional and personal development of own and colleagues in all interdisciplinary teams established to increase the health level of the society.	
15)	knows employee health, environment and occupational safety issues and takes responsibility when necessary.	
16)	knows health policies and is able to evaluate their effects in the field of application.	
17)	keeps medical knowledge up-to-date within the framework of lifelong learning responsibility.	
18)	applies own profession by knowing about ethical obligations and legal responsibilities, prioritizing human values and with self-sacrifice throughout own medical life.	

Assessment & Grading

Semester Requirements	Number of Activities	Level of Contribution
Presentation	1	% 40
Final	1	% 60
total		**% 100**
PERCENTAGE OF SEMESTER WORK		% 40
PERCENTAGE OF FINAL WORK		% 60
total		**% 100**

Workload and ECTS Credit Calculation

Activities	Number of Activities	Workload
Course Hours	16	48

Study Hours Out of Class	16	53
Presentations / Seminar	5	10
Final	1	2
Total Workload		**113**