Semester: 7th			
Paper code: AIML413T	L	T/P	Credits
Subject: Machine Learning in Healthcare	3	0	3

Marking Scheme:
1. Teachers Continuous Evaluation: As per university examination norms from time to time
2. End Term Theory Examination: As per university examination norms from time to time

INSTRUCTIONS TO PAPER SETTERS: Maximum Marks: As per university norms

1. There should be 9 questions in the end term examination question paper.
2. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions.
3. Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit.
4. The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/ level of the questions to be asked should be at the level of the prescribed textbooks.
5. The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required.

Course Objectives:

1.	Explain the role of machine learning in healthcare and its impact on medical decision-making.
2.	Apply machine learning algorithms to real-world healthcare datasets for predictive analysis.
3.	Evaluate the performance of machine learning models for medical applications using appropriate metrics.
4.	Develop healthcare solutions that utilize medical image analysis and provide interpretable results.

Course Outcomes:

CO1	Understand the fundamental machine learning algorithms and techniques used in healthcare applications.
CO2	Apply machine learning models to medical data for predictive modeling and disease diagnosis.
CO3	Analyze medical images using deep learning techniques for classification and segmentation tasks.
CO4	Design and develop healthcare decision support systems with ethical considerations in mind

Course Outcomes (CO) to Programme Outcomes (PO)

Mapping (Scale 1: Low, 2: Medium, 3: High

CO/ PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	-	-	2	2	2	-	1	1	-	-	1	1
CO2	-	-	2	2	2	-	1	-	-	-	1	1
CO3	-	-	2	2	2	-	1	-	-	-	1	1
CO4	1	1	3	2	2	1	1	1	1	1	1	1

Course Overview:

This course introduces students to the applications of machine learning in healthcare. It covers fundamental machine learning algorithms, data preprocessing for healthcare data, predictive modeling, medical image analysis, and healthcare decision support systems. Students will gain

insights into using ML techniques for medical diagnosis, treatment recommendation, and disease prediction.

Unit I [8]
Introduction to Healthcare Data and Machine Learning: Overview of healthcare data types and sources, Introduction to machine learning algorithms for healthcare, Data preprocessing and feature engineering for medical data

Unit II [8]
Supervised learning techniques for medical diagnosis: Unsupervised learning methods for clustering and anomaly detection, Evaluation metrics for healthcare predictions

Unit III [8]
Image processing and analysis in medical imaging: Deep learning for medical image classification and segmentation, Case studies: applications of ML in radiology and pathology,

Unit IV [8]
Building healthcare decision support systems using ML: Model interpretability and explainability in medical applications, Ethical considerations and challenges in ML healthcare deployments

Textbooks:
1. "Machine Learning in Medicine - A Complete Overview" by Ton J. Cleophas and Aeilko H. Zwinderman
2. "Healthcare Analytics Made Simple: Techniques in Healthcare Computing Using Machine Learning" by Aboelela E. Mady and Taposh Roy
3. "Machine Learning for Healthcare" by Le Lu, Yefeng Zheng, Gustavo Carneiro, and Lin Yang

Reference Books:
1. "Artificial Intelligence in Medicine" edited by Lei Xing and Alessandro Rizzo
2. "Machine Learning and Medical Imaging" edited by Guorong Wu, Dinggang Shen, Mert R. Sabuncu, and Pew-Thian Yap
3. "Healthcare Data Analytics" by Chandan K. Reddy, Charu C. Aggarwal, and Haesun Park