UNDERGRADUATE PROGRAM IN COMPUTER SCIENCE

DEPARTMENT OF COMPUTER SCIENCE AND ELECTRONICS

FACULTY OF MATHEMATICS AND NATURAL SCIENCES

UNIVERSITAS GADJAH MADA

Module name	**Machine Learning**
Module level	Undergraduate
Code	MII-3411
Courses (if applicable)	**Machine Learning**
Semester	Spring (Even)
Contact person	Afiahayati, S.Kom, M.Cs, Ph.D.
Lecturer	Afiahayati, S.Kom, M.Cs, Ph.D.
Language	Bahasa Indonesia and English
Relation to curriculum	Undergraduate degree program, Mandatory, 4th semester International undergraduate program, Mandatory, 4th semester
Type of teaching, contact hours	1.Undergraduate degree program: lectures, < 60 students 2.International undergraduate program: lectures, < 30 students
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 120 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.
Recommended prerequisites	Artificial Interlligence
Learning outcomes and their corresponding PLOs	<table><tr><td>LO</td><td>Description</td><td>Supported PLO</td></tr><tr><td>LO1</td><td>Students understand and are able to explain basic concepts in machine learning</td><td>PLO3</td></tr><tr><td>LO2</td><td>Students understand and are able to explain several linear classifier methods. Students are also able to solve problems with linear classifier methods and able to create a computer program that implements linear classifier method.</td><td>PLO4, PLO5</td></tr><tr><td>LO3</td><td>Students understand and are able to explain artificial neural networks, able to solve problems with artificial neural networks and able to create a computer programs that implements artificial neural networks</td><td>PLO4, PLO5</td></tr><tr><td>LO4</td><td>Students understand and are able to explain logistic regression, able to solve problems with logistic regression and able to create a computer program that implements logistic regression</td><td>PLO4, PLO5</td></tr></table>

	LO5	Students understand and are able to explain training objectives, overfitting, regularization. Students are also able to solve problems and able to create a computer program that implements training objectives, overfitting and regularization.	PLO4, PLO5
	LO6	Students understand and are able to explain non-linear classifier, kernels, support vector machine. Students are also able to solve problems and create a computer program that implements non-linear classifier, kernels, and support vector machine	PLO4, PLO5
	LO7	Students understand and are able to explain basic concepts of ensembles and boosting. Students are also able to solve problems and create a computer program that implements ensambles and boosting	PLO4, PLO5
	LO8	Students understand and are able to explain basic concepts of deep learning. Students are also able to solve problems and create a computer program that implements deep learning	PLO4, PLO5
	LO9	Students understand and are able to explain basic concepts of clustering. Students are also able to solve problems and create a computer program that implements clustering	PLO4, PLO5

Content	This course gives introduction about concepts, methods, and algorithms in machine learning. Topics in this course include: learning theory, supervised learning, unsupervised learning, classification, time series prediction and also some hot issues in machine learning including deep learning, support vector machine, hidden markov model and bayesian network.
Study and examination requirements and forms of examination	Mid-terms examination and Final examination.
Media employed	LCD, blackboard, websites, and e-learning.
Assessments and Evaluation	

LO	Method	Type	Percentage	Total
	Assignment 1	Formative	3%	
LO1	Question number 1, midterm exam	Summative	5%	**8%**

		Assignment 2	Formative	3%	3%
		Assigenment 3	Formative	3%	13%
	LO3	Question number 2, midterm exam	Summative	10%	
		Assignment 4	Formative	3%	8%
	LO4	Question number 3, midterm exam	Summative	5%	
	LO5	Assignment 5	Formative	3%	3%
		Assignment 6	Formative	3%	13%
	LO6	Question number 4, midterm exam	Summative	10%	
	LO7	Question number 5, midterm exam	Summative	5%	5%
		Assignment 7	Formative	3%	26%
		Assignment 8	Formative	3%	
	LO8	Question number 1, final exam	Summatifve	20%	
		Assignment 9	Formative	3%	13%
	LO9	Question number 2, final exam	Summative	10%	
		Assignment 10	Formatif	3%	8%
	LO10	Question number 3, final exam	Summatif	5%	
Reading List	W1 : Richard Duda, Peter Hart and David Stork, Pattern Classification, 2nd ed. John Wiley & Sons, 2001. W2 : Tom Mitchell, Machine Learning. McGraw-Hill, 1997. W3 : Trevor Hastie, Robert Tibshirani and Jerome Friedman, The Elements of Statistical Learning. Springer, 2009				