Machine Learning

Module name	Machine Learning	
Module level	Undergraduate	
Code	IF221218	
Courses (if applicable)	Machine Learning	
Semester	5/6	
Lecturer	Budi Nugroho, S.Kom, M.Kom (PIC) Agung Mustika Rizki, S.Kom, M.Kom	
Language	Bahasa Indonesia and English	
Relation to curriculum	Elective; 5th or 6th semester	
Type of teaching, contact hours	Lectures, < 60 students	
Teaching Methods	Project-based learning, problem-based learning, research base	
Workload	1. Lectures: 3 sks x 50 = 150 minutes (2 hours 30 minutes) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week	
Credit points	3 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	Artificial Intelligence	
Courses description	This course is designed to encourage students to understand fundamental ideas, intuition, concepts, algorithms, and techniques to enhance the intelligence of computers by applying specific algorithms, techniques, and methods. In this course, students are expected to innovate by developing a Machine Learning system for particular cases.	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Students are able to explain the concepts and terminologies in Machine Learning and engage in discussions on examples of pattern recognition method applications, whether from published journals or real-life applications that have been correctly implemented	PLO9 ,PLO10
	CO2 Students are able to apply and build each stage of the Machine Learning method, both in terms of theoretical concepts and practical implementation, using programming languages correctly.	PLO9,PLO10
	CO3 Students can assess and perform the methods used in Machine Learning using appropriate performance measurement evaluation.	PLO9,PLO10
Content	Basic machine learning techniques include supervised, unsupervised, and reinforcement learning. Problem areas and constraints in machine learning surround Classification and Clustering. Common and fundamental algorithms/techniques/methods for developing machine learning-based	

	systems include Bayes Classifier, Naive Bayes, Decision Trees, Artificial Neural Networks, Kohonen Networks, Self-Organizing Maps, K-Means, and K-Nearest Neighbors (K-NN).
Media employed	LCD, whiteboard, websites, books (as references), online meeting, etc.
Assessments and Evaluation	One written Midterm assessment (60 minutes) and one final oral exam (30 minutes), two short computer-based quizzes, take home written assignments
Study and examination requirements and forms of examination	The final grade in the module is composed of: • Two short computer-based quizzes: 15% x 2 = 30% • Take-home written assignments : 15% • Written Midterm assessment: 25% • Final oral exam: 30% Students must have a final grade of 55.6% or higher to pass.
Reading List	● V. Chernozhukov, C. Hansen, N. Kallus, M. Spindler, and V. Syrgkanis, Applied causal inference powered by ML and AI. arXiv:2403.02467, 2024. ● B. Peng et al., Deep learning and machine learning: Advancing big data analytics and management with design patterns. arXiv:2410.03795, 2024. ● A. Narayanan and S. Kapoor, AI Snake Oil: What Artificial Intelligence Can Do, What It Can't, and How to Tell the Difference. Princeton, NJ, USA: Princeton University Press, 2024. ● Y. Liu, Python Machine Learning by Example, 3rd ed. Birmingham, UK: Packt Publishing, 2024. ● Kang, Minsoo, Park, Sung Yul, Chung, Myeong-Ae, and Han, Dong-Hun. No-Code AI: Concepts and Applications in Machine Learning, Visualization, and Cloud Platforms. World Scientific Publishing Co Pte Ltd, 2024. ISBN: 9789811293887. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/BPB0000734?searchid=1754988976064iXvX8AGyVudLx8irRw1Um ● Das, Abhishek. Data Science Essentials with R: Learn with Focus on Data Manipulation, Visualization, and Machine Learning. BPB Publications, 2024. ISBN: 9789365895292. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/BPB0000734?searchid=1754988976064iXvX8AGyVudLx8irRw1Um