Pattern Recognition

Module name	Pattern Recognition	
Module level	Undergraduate	
Code	IF221125	
Courses (if applicable)	Pattern Recognition	
Semester	7	
Lecturer	Budi Nugroho, S.Kom, M.Kom (PIC) Achmad Junaidi, S.Kom, M.Kom Eka Prakarsa Mandyartha, ST, M.Kom Fetty Tri Anggraeny, S.Kom, M.Kom	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program; compulsory; 7th semester	
Type of teaching, contact hours	Lectures, < 60 students,	
Teaching Methods	Simulation, case study, collaborative, project-based learning, problem-based learning	
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	Pattern recognition is a Case Method and Project-Based course that explores the concepts and practices related to methods in the stages of pattern recognition in solving classification and clustering problems. Some of the topics covered in this course include: basic concepts of pattern recognition; stages in the pattern recognition process; statistical and syntactic approaches related to feature extraction and feature selection; introduction to various classification and clustering methods; computation of evaluation methods in pattern recognition; and several case studies from published journals on the application of pattern recognition methods	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Students are able to explain the terminologies of pattern recognition and engage in discussions on examples of pattern recognition method applications from various published journals. (C2, A2)	PLO2, PLO4, PLO6, PLO7, PLO10
	CO2 Students are able to analyze, implement, and build each stage of pattern recognition, both in terms of theoretical concepts and practical implementation using programming languages according to the referenced publications that have been studied. (C3, P4)	PLO2, PLO4, PLO6, PLO7, PLO10

	CO3 Students are able to evaluate and perform the classifications and clustering methods in pattern recognition using proper performance measurement evaluation. (C5, P3)	PLO2, PLO4, PLO6, PLO7, PLO10
Content	The subjects covered in this course include: Understanding and Stages of Pattern Recognition; Applications of Pattern Recognition Methods; Sequence of Pattern Recognition Stages; Statistical and Syntactic Methods for Feature Extraction and Selection in Pattern Recognition; Pattern Recognition Classification Methods; Pattern Recognition Clustering Methods; Performance Measurement and Evaluation Methods for Pattern Recognition Algorithms; and Implementation of Pattern Recognition Methods in Programming Languages.	
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, takehome 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	• U. M. Braga-Neto, Fundamentals of Pattern Recognition and Machine Learning, 2nd ed. Cham, Switzerland: Springer, 2024. • Cambridge University Press, Machine Learning Evaluation: Towards Reliable and Responsible AI. Cambridge, UK: Cambridge University Press, 2024. • J. A. Fessler and R. R. Nadakuditi, Linear Algebra for Data Science, Machine Learning, and Signal Processing, 2024. • M. Blom, N. Nobile, and C. Y. Suen (Eds.), Advances in Pattern Recognition and Artificial Intelligence. World Scientific, Nov. 16, 2021. ISBN: 981-1239029, 978-981-1239021. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/WSPCB0010651?searchid=1755054865167FMvsp7T46ehCRSJBxTVMl • M. A. El-Yacoubi, N. Vincent, and C. Kurtz (Eds.), Emerging Topics in Pattern Recognition and Artificial Intelligence. World Scientific Publishing Company, Sep. 20, 2024. ISBN: 981-1289115, 978-981-1289118. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/WSPCB0011781?searchid=17550547997751D1ZjMEJJpTQPKJFFQ9Yu	