Advanced Database

Module name	Advanced Database	
Module level	Undergraduate	
Code	IF221114	
Courses (if applicable)	Advanced Database	
Semester	3	
Lecturer	Retno Mumpuni, S.Kom, M.Sc (PIC) Dr. Rr. Ani Dijah Rahajoe, S.T, M.Cs Sugiarto, S.Kom, M.Kom	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program; compulsory; 3rd semester	
Type of teaching, contact hours	Lectures, < 60 students	
Teaching Methods	Simulation, case study, collaborative learning, 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	Linear Algebra and Matrices	
Courses description	In this course, students Discussing the basic concepts of computation involving errors and learning computational methods for solving problems related to nonlinear equations, simultaneous linear equations, differentiation, and integration.	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Students are able to understand concepts of analytical, numerical, linear, and nonlinear methods..	PLO3,PLO5
	CO2 Students are able to understand and apply solutions for linear and nonlinear equations using a programming language.	PLO3,PLO5
	CO3 Students are able to understand and implementation of differentiation and integration concepts using a programming language.	PLO3,PLO5
Content	Basic concepts of analytical and numerical methods, differences between analytical and numerical methods, fundamental concepts of linear and nonlinear equations, solving linear and nonlinear equations using manual calculations and programming languages, solving differentiation concepts using manual calculations and programming languages, solving integral concepts using manual calculations and 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	● Q. Hao, M. Tsikerdekis, Grokking Relational Database Design 1. Manning Publications, 2025. ● F. Li, X. Zhou, P. Cai, R. Zhang, G. Huang, X. Liu, Cloud Native Database: Principle and Practice. Springer Nature Singapore, 2025. ● R. S. Danturthi, Database and Application Security: A Practitioner's Guide. R. Sarma Danturthi, 2024. ● A. Tezuysal, I. Ahmed, Database Design and Modeling with PostgreSQL and MySQL: Build efficient and scalable databases for modern applications using opensource databases, 1st edition. Packt Publishing Limited, 2024. ISBN: 9781803233475. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/PACKT0007468?searchid=1754983919068BUMydZKNr3h9HUcaIEhlw ● W. Ahmed, Advanced Database Systems. Toronto Academic Press, 2024. ISBN: 9781774697610. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/ARCLER0001564?searchid=1754983961199xEyfadMtN_bEo60QtaFug ● Bocso, Laszlo, Database Mastery with Python: SQL, NoSQL, and Beyond, Independently published, 2024. ● J. C. Patni, L. Pinjarkar, Kickstart Database Management System Fundamentals: Key Concepts, Principles, and Advanced Techniques for Modern Database Design, Management, and Optimization. Orange Education, 2024.