



# MODULE HANDBOOK

## Introduction to Graph Theory

**BACHELOR DEGREE PROGRAM**  
**DEPARTMENT OF MATHEMATICS**  
**FACULTY OF SCIENCE AND DATA ANALYTICS**  
**INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

# MODULE HANDBOOK

## Introduction to Graph Theory

Module name	<b>Introduction to Graph Theory</b>	
Module level	Undergraduate	
Code	KM184713	
Course (if applicable)	Introduction to Graph Theory	
Semester	Fall (Ganjil)	
Person responsible for the module	Dr. Darmaji, S.Si, MT	
Lecturer	Dr. Darmaji, S.Si, MT	
Language	Indonesia and English	
Relation to curriculum	Undergraduate degree program, <b>elective</b> , 7 <sup>th</sup> semester.	
Type of teaching, contact hours	Lectures, <60 students	
Workload	<ol style="list-style-type: none"> <li>1. Lectures : 2 x 50 = 100 minutes per week.</li> <li>2. Exercises and Assignments : 2 x 60 = 120 minutes (2 hours) per week.</li> <li>3. Private learning : 2 x 60 = 120 minutes (2 hours) per week.</li> </ol>	
Credit points	2 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	-	
Learning outcomes and their corresponding PLOs	<p>Course Learning Outcome (CLO) after completing this module,</p> <p>CLO-1 Be able to understand the basics of Graph Theory and be able to communicate it actively, both orally and in writing.</p> <p>CLO-2 Be able to understand the concept of coloring, apply it to simple cases and be able to communicate it actively, both oral and written.</p> <p>CLO-3 Be able to understand the concept of labeling, apply it to simple cases and be able to communicate it actively, either orally or in writing.</p> <p>CLO-4 Be able to understand the concept of distance, apply it to simple cases and be able to communicate it actively, both orally and in writing.</p> <p>CLO-5 Be able to understand the concept of trees, apply Binary Search and Prefix Code.</p>	

Content	Graph Theory studies the following set of vertices and sides with a relation that connects them. At a practical level, nodes can represent real entities and sides can represent relationships that occur between these entities. In this course, you will study the use of the principles in graph theory as a tool to model a problem, solve the model and return the solution to the problem being modeled.
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> <li>• In-class exercises</li> <li>• Assignment 1, 2</li> <li>• Mid-term examination</li> <li>• Final examination</li> </ul>
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.
Reading lists	<p>Main :</p> <ol style="list-style-type: none"> <li>1. Nora Hartsfield, Gerhard Ringel, "Pearls in Graph Theory", Dover Publications, Inc., 2003.</li> <li>2. I Ketut Budayasa, "Teori Graf dan Aplikasinya", Unesa University Press, 2007.</li> </ol> <p>Supporting :</p> <ol style="list-style-type: none"> <li>1. Garry Chartrand, Ping Zhang, "A First Course in Graph Theory", Dover Publications, Inc., 2012.</li> </ol>