



# HEURISTIC TECHNIQUES

Exploring Intelligent Approaches  
for Complex Optimization Problems



Lecturer  
**Yisti Vita Via**



**Informatics**  
Faculty of Computer Science  
UPN "Veteran" Jawa Timur



# COURSE OUTLINE

MEETING

1

Fundamentals of Heuristic Optimization

MEETING

2

Optimization Problem Formulation and Search Space Representation

MEETING

3

Local Search and Neighborhood-Based Optimization

MEETING

4

Greedy and Constructive Heuristic Methods

MEETING

5

Randomized Search and Stochastic Optimization

MEETING

6

Simulated Annealing for Combinatorial Optimization

MEETING

7

Tabu Search and Memory-Based Optimization

MEETING

8



**Midterm Examination**

*Theoretical and Problem-Solving Assessment*

MEETING

9

Genetic Algorithms for Optimization

MEETING

10

Evolutionary and Population-Based Optimization

MEETING

11

Ant Colony Optimization

MEETING

12

Particle Swarm Optimization

MEETING

13

Hybrid and Adaptive Heuristic Methods

MEETING

14

Performance Evaluation of Heuristic Algorithms

MEETING

15

Experimental Benchmarking and Comparative Analysis

MEETING

16



**Final Examination**

*Integrated Heuristic Optimization Assessment*



# COMPETENCY STAGES

**M1–M2**

**Understanding & Formulation**

Students understand heuristic optimization and formulate optimization problems.

**M3–M7**

**Application & Algorithmic Problem Solving**

Students apply and analyze different heuristic search strategies.

**M8**

**Assessment**

Students demonstrate their understanding through theoretical and problem-solving tasks.

**M9–M13**

**Advanced Application & Design**

Students apply population-based, evolutionary, and hybrid optimization techniques.

**M14–M15**

**Evaluation & Analysis**

Students evaluate algorithm performance and conduct comparative experiments.

**M16**

**Assessment**

Students demonstrate integrated knowledge and problem-solving competence in heuristic optimization.



# ASSESSMENT SCHEME



## Attendance

Active participation in class activities, discussions, and learning engagement.



## Active Participation

Contribution to discussions, questions, and collaboration in class.



## Exercise Assignments

Completion of weekly problem sets and practice exercises.



## Programming Assignments

Implementation of heuristic algorithms and programming tasks.



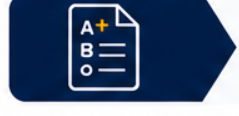
## Presentation Assignments

Group or individual presentations on topics and project progress.



## Midterm Examination

Theoretical and problem-solving assessment on the first half of the course.



## Final Examination

Comprehensive assessment covering the entire course material.



# LEARNING MEDIA



**Face-to-Face in Class**



**Online via Zoom or Google Meet**



**Learning Videos**



**<https://ilmu2.upnjatim.ac.id/>**



**<https://web.whatsapp.com/>**



# TASK



**Class Coordinator Election**



**Register on ILMU**



**Update WhatsApp Identity**



**Join the Class WhatsApp Group**



**Form a Group**

