



HEURISTIC TECHNIQUES

Exploring Intelligent Approaches
for Complex Optimization Problems



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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.



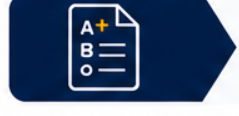
Presentation Assignments

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/>



TASKS



Class Coordinator Election



Register on ILMU



Update WhatsApp Identity



Join the Class WhatsApp Group



Form a Group

