

The background of the slide is a grayscale image of a circuit board. It features various traces, pads, and circular components. A prominent dark horizontal band runs across the middle of the image, serving as a background for the title text.

# Design and Analysis of Algorithm

Munawar, PhD

# Analysis and Design of Algorithm

- Algorithm analysis

Analysis of resource usage of given algorithms (time , space)

- Efficient algorithms

Algorithms that make an efficient usage of resources

- Algorithm design

Methods for designing efficient algorithms

# Why Study this Subject?

- Algorithm analysis provides a means to distinguish between what is practically possible and what is practically impossible.
- Efficient algorithms lead to efficient programs that make better use of computer resources.
- Efficient programs sell better.
- Programmers who write efficient programs are preferred.

# Objectives?

- To gain experience in fundamental techniques used for algorithm analysis.
- To gain experience in the main methodologies used for the design of efficient algorithms.
- To study the most important computer algorithms of current practical use.

# Grading

- Mid Exam → 20 %
- Final Exam → 30 %.
- Project → 50 %

# Project

- Deliverables :
  - ✓ System Requirements (UTS) → Hard copy
  - ✓ Pseudocode / Activity diagram (UAS) → Hard Copy
  - ✓ Application in python (UAS) → Soft copy : aplikasi dan data mentah
- Topics
  - ✓ Text Mining
  - ✓ Web Crawling
  - ✓ Graph
  - ✓ Big Data
  - ✓ etc

# Outlines

Theories		Labs	
1. Intro	8. Dynamic Prog.	1. Python installation	8. Graph
2. Analysis Technique	9. Back Tracking	2. Python basic	9. Back Tracking
3. Brute force	10. Graph	3. Looping	10. Shortest Path
4. Transform and Conquer	11. Branch & Bound	4. Input and Output	11. Matplotlib
5. Divide and Conquer	12. Shortest Path	5. Function	12. Numpy
6. Greedy	13. Spanning Tress	6. String	13. Pandas
7. Dynamic Prog.	14. Review	7. Data Structure	

# References

- A. Levitin. *Introduction to The Design and Analysis of Algorithms – 3rd Edition*, Pearson, 2011.
- T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein. *Introduction to Algorithms – 3rd Edition*, MIT Press, 2009.
- Wahl, M. *Python and Algorithms*. 2013