



UNIVERSITAS INDONESIA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Building D, Kampus UI Depok 16424, Telp: 021 - 7863439,
Email: sekretariat.math@sci.ui.ac.id, website: <https://www.math.ui.ac.id/>

MODULE HANDBOOK

Module designation	<i>Design and Analysis of Algorithm</i>
Semester(s) in which the module is taught	3
Person responsible for the module	<i>Gatot F. Hertono</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Elective course</i>
Teaching methods	<i>Flipped learning and computer lab works</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 9 hours/week x 14 weeks + 5.5 hours/week x 2 weeks = 137 hours. Contact hours: 150 minutes lectures. Individual study including examination preparation, specified in hours : 3 hours structured learning and 3 hours individual study per week.</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<i>This course has been designed with an emphasis on Algorithmic, which is a systematic study of the use of basic techniques to design and analyze efficient algorithms. After completing this course, students are expected to be able to apply the concept of time complexity, asymptote notation and recursive relation in determining the performance of an algorithm. Students are also expected to be able to implement several algorithmic techniques such as Divide and Conquer, Dynamic Programming, Greedy Algorithm and Graph Algorithm in various types of problems and have knowledge in Parallel Algorithms.</i>

Content	<ol style="list-style-type: none"> 1. <i>Algorithm Concepts;</i> 2. <i>Analysis of Algorithm</i> <ol style="list-style-type: none"> a. <i>Time Complexity;</i> b. <i>Asymptotic notation;</i> c. <i>Recurrence Relation;</i> 3. <i>Design of Algorithm</i> <ol style="list-style-type: none"> a. <i>Brute Force;</i> b. <i>Divide and Conquer;</i> c. <i>Greedy;</i> d. <i>Dynamic Programming;</i> e. <i>Graph Algorithm;</i> 4. <i>Introduction to Parallel Algorithm.</i>
Examination forms	<i>Essay</i>
Study and examination requirements	<p><i>Requirements for successfully passing the module:</i> <i>Individual assignment and lab works (30%), midterm exam (35%), final exam (35%)</i></p>
Reading list	<p><i>[1] Gilles Brassard, Paul Bratley, Algorithmics: Theory & Practice, 1988, Prentice Hall.</i></p> <p><i>[2] Cormen Thomas H., Leiserson Charles E., Rivest Ronald L., Introduction to Algorithms, 1991, Mc.McGraw-Hill.</i></p> <p><i>[3] Harsh Bhasin, Algorithms: Design and Analysis, 2015, Oxford.</i></p> <p><i>[4] Kenneth A. Berman, Jerome L. Paul, Fundamentals of Sequential and Parallel Algorithms, 1997, ITP.</i></p>