# HANDBOOK

**BACHELOR OF INFORMATICS PROGRAM**
**DEPARTMENT OF INFORMATICS**
**FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY**
**INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

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| Module name | **Data Structures** |
| Module level | Undergraduate |
| Code | IF184202 |
| Courses (if applicable) | **Data Structures** |
| Semester | 2 |
| Contact person | |
| Lecturer | Ir.F.X. Arunanto M.Sc.<br>Abdul Munif, S.Kom., M.Sc.<br>Dwi Sunaryono S.Kom., M.Kom.<br>Dr.techn. Ir.Raden Venantius Hari Ginardi M.Sc<br>Agus Budi Raharjo, S.Kom, M.Kom., Ph.D. |
| Language | Bahasa Indonesia and English |
| Relation to curriculum | 1. Undergraduate degree program; mandatory; 2nd semester.<br>2. International undergraduate program; mandatory; 2nd semester. |
| Type of teaching, contact hours | 1. Undergraduate degree program: lectures, < 60 students,<br>2. International undergraduate program: lectures, < 40 students |
| Workload | 1. Lectures: 3 x 50 = 150 minutes (2 hours 30 minutes) per week.<br>2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week.<br>3. Private study: 3 x 60 = 180 minutes (3 hours) per week. |
| Credit points | 3 credit points (sks). |
| Requirements according to the examination | A student must have attended at least 80% of the lectures to sit in the exams. |

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| Mandatory prerequisites | Programming Fundamental | |
| Learning outcomes and their corresponding PLOs | After completing this module, a student is expected to: | |
| | **CO1** Students are able to do data abstraction on real problems according to the concept of linear data structures (*stack, queue*) and non-linear (*tree, graph*) by using C / C++ | |
| | **CO2** Students are able to implement data access algorithms on a linear structure in a static (*array*) and dynamic *(linked-list*) to solve problems that pay attention to the order of incoming data (FIFO, LIFO) using C / C ++ | |
| | **CO3** Students are able to implement data access algorithms on nonlinear structures in solving problems using C / C ++ | |
| | **CO4** Students are able to implement a *hash-table* structure for big data access algorithms based on characteristic data in solving problems using C / C ++ | |
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| Content | Knowledge:<br>Mastering principles of algorithm development and various programming language concepts<br><br>Specific Skill:<br>Capable of designing and analyzing of algorithms to solve problems effectively and efficiently based on programming principles, and able to apply programming model in various programming language; and able to choose programming languages in producing appropriate applications | |
| Study and examination requirements and forms of examination | Mid-terms examination and Final examination. | |
| Media employed | LCD, whiteboard, websites, books (as references), etc. | |
| Assessments and Evaluation | | |

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| Reading List | Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++ 4ed”, Addison-Wesley, New Jersey, 2014<br><br>Robert Sedgewick, Philippe Flajolet, “An Introduction to the Analysis of Algorithms 2ed”, Addison-Wesley, New Jersey, 2013 |