## Linear Programming

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| Module designation | Linear Programming |
| Semester(s) in which the module is taught | 2 |
| Person responsible for the module | Dr. Eti Dwi Wiraningsih/Ibnu Hadi, M. Si |
| Language | Indonesia |
| Relation to curriculum | *Compulsory* |
| Teaching methods | Teaching methods used in this course are:   * Lecture (small group discussions and project-based learning) * Structured assignments (individual task) |
| Workload (incl. contact hours, self-study hours) | Total workload is 510 minutes  per week which consists of 150 minutes learning activity, 180 minutes structured task and 180 minutes individual learning per week for 16 weeks.  **TOTAL WORKLOAD PER SEMESTER**  **510 X 16 = 8160 minutes = 136 hours** |
| Credit points | 136 hours / 30 hours 4,5 ECTS |
| Required and recommended prerequisites for joining the module | *Linear Algebra* |
| Program intended learning outcomes | **PLO 5**. Able to make appropriate decisions in the context of solving problems in their area of expertise, based on the results of information and data analysis.  **PLO 8**. Mastering the principles of mathematical modeling, linear programming, differential equations, and numerical methods.  **PLO 9**. Able to conduct research independently or in groups that can be used to provide guidance to stakeholders in choosing various alternative solutions to problems in mathematics.  **PLO 11**. Able to observe, recognize, formulate and solve problems through a mathematical approach with or without the help of software.  Course Learning Outcomes (CLO) to be achieved in this course are:   |  |  |  | | --- | --- | --- | | CLO 1 | : | Be able to formulate the concept of algebraic manipulation for solving linear programming problems | | CLO 2 | : | Be able to solve linear programming problems using graphical methods | | CLO 3 | : | Be able to formulate theories and concepts of the simplex method for solving mathematical problems | | CLO 4 | : | Be able to relate the relationship between the primal and dual cases | | CLO 5 | : | Be able to formulate a mathematical model formulation for integer problems | | CLO 6 | : | Able to analyze transportation problems | | CLO 7 | : | Able to analyze assignment issues | | CLO 8 | : | Able to implement theoretical concepts with the help of software | |  |  |  |   The relationship between PLO and CLO in this course is described as follows:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | CLO | PLO | | | | | 5 | 8 | 9 | 11 | | 1 | √ |  |  |  | | 2 |  | √ |  | √ | | 3 |  |  |  |  | | 4 | √ |  |  | √ | | 5 | √ |  | √ |  | | 6 |  | √ |  |  | | 7 |  |  | √ |  | | 8 | √ |  | √ |  | |
| Content | **Students will learn about:**  Mathematical Models, Linear Programming, Graphical Method, The Simplex Method, Primal Dual, Integer Programs, Transportation, Assignments |
| Examination forms | Assessment for this course includes:  20% structured assignments, 30% midterms and 50% final exams |
| Study and examination requirements | **Study and examination requirements:**  Students should have attended all lectures and submitted all scheduled individual and group assignments prior to the final examination. |
| Reading list | **Main References:**  Bazaraa Mokhtar & Jarvis John J. (1977). *Linear Programming and Network Flows*. New York – London – Santa Barbara – Sydney – Toronto: John Willey & Sons.  **Additional References:**   1. Sitorus, Parlin, 1997, *Program Linear*, Universitas Trisakti, Jakarta. 2. Soemartojo, N., 1988, *Program Linear*, Universitas Terbuka. 3. Supranto, J., 1983, *Linear Programming*, Edisi Kedua, Fakultas Ekonomi Universitas Indonesia. 4. Taha, H.A., 2003, *Operation Research*: *An Introduction*, Seventh Edition, Prentice Hall. 5. Taylor, Bernard W., 2005, *Introduction to Management Science*, Eighth Edition, Prentice-Hall. |