



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Undergraduate Programme in Mathematics

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MODULE HANDBOOK

Module name	Linear Programming												
Module level, if applicable	Bachelor												
Code, if applicable	MMM-2312												
Subtitle, if applicable	-												
Courses, if applicable	Linear Programming												
Semester(s) in which the module is taught	3 rd (third)												
Person responsible for the module	Chair of the Lab. of Applied Mathematics and Chair of the Lab. of Mathematical Computation												
Lecturer	Dr. Indarsih, S.Si., M.Si.												
Language	Bahasa Indonesia												
Relation to curriculum	Compulsary course in the second year (3 rd semester) Bachelor Degree												
Type of teaching, contact hours	100 minutes lectures, 240 minutes structured activities (homework and task), and 170 minutes laboratory work per week.												
Workload	Total workload is 136 hours per semester, which consists of 100 minutes lectures per week for 14 weeks, 120 minutes structured activities per week, 120 minutes individual study per week, and 170 minutes laboratory work per week, in total is 16 weeks per semester, including mid exam and final exam.												
Credit points	3 (1)												
Requirements according to the examination regulations	Students have taken Linear Programming course (MMM-2312) and have an examination card where the course is stated on.												
Recommended prerequisites	Students have taken Elementary Linear Algebra course (MMM-1202) and have participated in the final examination of the course.												
Module objectives/intended learning outcomes	CO 1. Students are able to solve the linear programming (LP) and integer programming (ILP). CO 2. Students are able to prove the theory of LP and duality. CO 3. Students are able to apply the sensitivity analysis in the LP. CO 4. Students are able to formulate the LP and ILP from real problems. CO 5. Students are able to use some software of optimization to solve the LP and ILP.												
Content	1. Introduction to Linear Programming (LP): formulate of the LP model. 2. Graphical of LP solution. 3. The Simplex Method. 4. Infeasible solution, unbounded solutions, degeneracy, alternative solutions 5. Theory of Linear Programming. 6. Duality: definition of the Dual Problem, Duality Theorems, economic interpretation of dual variables and dual constraints. 7. Sensitivity Analysis: graphical sensitivity analysis. 8. Integer Programming: formulate of the ILP and Branch and Bound algorithm 9. Laboratory work.												
Study and examination requirements and forms of examination	The final mark will be weighted as follows: <table><tr><td>No</td><td>Assessment methods (components, activities)</td><td>Weight (percentage)</td></tr><tr><td>1.</td><td>Final Examination</td><td>35</td></tr><tr><td>2.</td><td>Mid-Term Examination</td><td>30</td></tr><tr><td>3.</td><td>Quiz, Homework, Presentation, Laboratory work</td><td>35</td></tr></table>	No	Assessment methods (components, activities)	Weight (percentage)	1.	Final Examination	35	2.	Mid-Term Examination	30	3.	Quiz, Homework, Presentation, Laboratory work	35
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1.	Final Examination	35											
2.	Mid-Term Examination	30											
3.	Quiz, Homework, Presentation, Laboratory work	35											

	The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	Projector, board, computer, e-learning via http://elisa.ugm.ac.id , Software win-QSB
Reading List	[1] G. Hadley, 1973, <i>Linear Programming</i> , Addison Wesley. [2] Hamdy A. Taha, 1998, <i>Operations Research an Introduction</i> , Prentice-Hall, Pte Ltd, Singapore. [3] Wayne L. Winston, 2004, <i>Operation Research Application and Algorithms</i> , Ruxbury Press. [4] Indarsih, 2016, <i>Modul Praktikum Program Linear</i> , Departemen Matematika, FMIPA, UGM.

CO and PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1					v				
CO 2		v	v						
CO 3			v						
CO 4					v		v		v
CO 5				v					