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MODULE HANDBOOK

Module name	Operation Research
Module level, if applicable	Bachelor
Code, if applicable	MMM-2311
Subtitle, if applicable	-
Courses, if applicable	Operation Research
Semester(s) in which the module is taught	3th (third)
Person responsible for the module	Chair of the Lab. of Applied Mathematics and Chair of the Lab. of Mathematical Computation
Lecturer(s)	Dr. Indarsih, S.Si., M.Si. Dr. Irwan Endrayanto A, S.Si., M.Sc.
Language	Bahasa Indonesia
Relation to curriculum	Elective course in the second year (3th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study 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 Operation Research course (MMM-2311) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken the module of Linear Programming (MMM-2312) and have participated in the final exam of the module.
Module objectives/intended learning outcomes	CO 1. Students are able to analyze models in operation research. CO 2. Students are able to solve the models by their algorithms. CO 3. Students are able to apply the models in real problems. CO 4. Students are able to using software optimization to solve the models in operation research.
Content	Model, application and algorithm for transportation, transshipment, assignment, and travelling salesman problem. Network models: shortest path problem, minimum spanning tree, maximum flow and critical path method. Deterministic and probabilistic dynamic programming. Inventory models. Queuing theory. Laboratory work.
Study and examination requirements and forms of examination	The final mark will be weighted as follows: No — Assessment methods (components, activities) — Weight (percentage) 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, win-QSB.
Reading List	[1] Indarsih, 2016, Modul Praktikum Riset Operasi, Departemen Matematika, FMIPA, UGM [2] Hamdy A. Taha, 2007, *Operations Research an Introduction, 8th Ed,* Prentice-Hall, Pte Ltd, Singapore.

	[3] John A. Lawrence and Barry A. Pasternack, 2006, *Applied Management Science*, John Wiley &Sons Inc. [4] Wayne L. Winston, 2004, *Operation Research Application and Algorithms,* Ruxbury Press. [5] David R. Anderson, Dennis J. Sweeney, and Thomas A. William, 1985, *An Introduction to Management Sciences : Qualitative Approach to Decision Making, Fourth Edition*, South Western Educational Publishing

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				
CO 3					v		v		v
CO 4				v					