Module Handbook

Module Name:	Operation Research
Module Level:	Sarjana (S-1) / Bachelor
Abbreviation, if applicable:	8420203193
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	3/ second year
Module Coordinator(s):	Dr. Yusuf Fuad, M.AppSc
Lecturer(s):	Dr. Yusuf Fuad, M.AppSc Yuliani Puji Astuti, M.Si
Language:	Indonesia
Relation to Curriculum:	For all level students, Compulsory course/ ~~elective studies~~
Teaching format/class hours per week during the semester	Teaching format: lectures, tutorial assignment, and individual study. 3 x 170 minutes = 510 minutes = 8.5 hours lectures
Workload:	15 weeks per semester consisting of: ➢ 2.5 hours lectures (3 x 50 minutes) per week, ➢ 3 hours tutorial assignments (3 x 60 minutes) per week, ➢ 3 hours individual study (3 x 60 minutes) per week, Total workload : 14x3x170 minutes = 7,140 minutes = 4.76 ECTS*
Credit Point:	3
Requirements:	-
Learning Goals :	**Knowledge** CLO-1 :Identify and explain variables and arrange them in a linear programming model. CLO-2: Formulate and solve fundamental mathematical problems related to basic solutions to systems of linear equations using basic solutions which are the basis for finding a feasible solution in the simplex method. **Skills** CLO-3: Use the method of finding solutions in solving mathematical problems in linear programs which include the simplex method, the BigM and Two-Phase method,

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<tr><td></td><td>duality and sensitivity analysis, the North West Corner method, Minimum Cost, and Vogels Approximation Method, Modified Distribution, Stepping Stone and Hungarian Method.
CLO-4: Use the Solver application in Microsoft Excel to help determine solutions to linear program problems</td></tr>
<tr><td>Content</td><td>Linear program modeling, graph and search line methods, basic solutions to systems of linear equations, simplex method, BigM and Two-Phase methods, duality, solving linear programs using Solver application, sensitivity analysis, North West Corner method, Minimum Cost, and Vogel's Approximation Method , Modified Distribution, Stepping Stone and Hungarian Method.</td></tr>
<tr><td>Study/exam achievements</td><td>➢ Students are considered competent and pass if the final score calculated from the score of midterm exam, assignments, participation, and final exam is at least 55 or C.
➢ Final score is calculated as follows:
➢ 20% midterm exam + 30% assignments + 20% participation + 30% final exam
➢ Final index is defined as follow:
<table><tr><td>Index</td><td>Converted Score</td><td>Score Range</td></tr><tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr><tr><td>A-</td><td>3.75</td><td>$80 \leq A- < 85$</td></tr><tr><td>B+</td><td>3.50</td><td>$75 \leq B+ < 80$</td></tr><tr><td>B</td><td>3.00</td><td>$70 \leq B < 75$</td></tr><tr><td>B-</td><td>2.75</td><td>$65 \leq B- < 70$</td></tr><tr><td>C+</td><td>2.50</td><td>$60 \leq C+ < 65$</td></tr><tr><td>C</td><td>2.00</td><td>$55 \leq C < 60$</td></tr><tr><td>D</td><td>1.00</td><td>$40 \leq D < 55$</td></tr><tr><td>E</td><td>0.00</td><td>$0 \leq E < 40$</td></tr></table></td></tr>
<tr><td>Forms of Media</td><td>Slides and LCD projectors, whiteboard, samples of learning media</td></tr>
<tr><td>Literature</td><td>[1] Ravindran, A R., Operations Research and Management Science, 2008, Taylor & Francis Group
[2] 2] M. S. Bazaraa, J. J. Jarvis and H. D. Sherali, 2010, Linear Programming and Network Flows, Fourth Edition, John Wiley & Sons, New York.
[3] Thaha, H.A, 2007, Operations Research: An Introduction, Eighth edition, Pearson Education Inc.</td></tr>
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	[4] Poler, 2014, Operation Research Problems, Statements and Solutions, Springer.
Note	*Total hours per 1 credit in 1 semester={(1 credit x 170 minutes x 14 weeks)/60 minutes}=39.67 hours. each ECTS equals with 25 hours therefore 1 credit in 1 semester equals 1.59 ECTS.