UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS EDUCATION
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Bachelor of Science in Mathematics **MODULE HANDBOOK**

Module name:	Optimization Theory
Module level,if applicable:	Undergraduate
Code:	MAT6356
Sub-heading,if applicable:	-
Classes,if applicable:	-
Semester:	6^{th}
Module coordinator:	Kus Prihantoso Krisnawan, M.Si.
Lecturer(s):	Kus Prihantoso Krisnawan, M.Si.
Language:	Bahasa Indonesia
Classification within the curriculum:	Elective course
Teaching format / class hours perweek during the semester:	150 minutes lectures and 180 minutes structured activities per week.
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes self-study per week for 16 weeks.
Creditpoints:	3
Prerequisites course(s):	Linear Programming (MAT6319)
Course outcomes:	After taking this course the students have ability to: CO 1. Respecting other people's views, opinions,and original ideas CO 2. Understanding definitions, theorems, and some algorithmsto get an optimal solutionusing critical and systematic thinking in a manner individually or groups CO 3. Communicating, in writing or verbally,ideas to

<table>
<tr><td></td><td>understand or solve mathematical problems.
CO 4. Explainingthe right methodoralgorithm to solve an optimization problem.
CO 5. Making an appropriate mathematics optimization model.
CO 6. Making a computer programming using the right algorithm to make a simulation or to find an optimal solution of a mathematics optimization problem.</td></tr>
<tr><td>Content:</td><td>This course containsdefinitions and theorems as the foundations of mathematics optimization theory and methods to get optimal solutions of mathematicsoptimization problems.
As the foundations, the discussed theory are Euclidean space, convex sets and convex functions, real functions, gradient, global and local extreme. Meanwhile, the methods of getting solution will be split on three parts; unconstrained optimization, constrained optimization of differentiable functions, and nondifferentiable optimization.</td></tr>
<tr><td>Study/exam achievements:</td><td>CO1: Attitude assessment is carried out at each meeting by observation and / or self-assessment techniques using the assumption that basically every student has a good attitude. The student is given a value of very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not a component of the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude.

The final grades will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Objek Penilaian</th><th>Teknik Penilaian</th><th>Bobot</th></tr>
<tr><td>1</td><td>CO 2, 4, and 6</td><td>a. Presentation
b. Individual Assignment
c. Quiz</td><td>Observation
Written

Written</td><td>10%
10%

20%</td></tr>
<tr><td>2</td><td>CO 3 and5</td><td>a. Group</td><td>Written</td><td>10%</td></tr>
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</td></tr>
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			Assignment b. Mid test c. Final test		 20% 30%
				Total	100%
Forms of media:	Board, LCD Projector, Laptop/Computer				
Literature:	1. Ruszczyński. 2006. *Nonlinear Optimization*. PrincentonNew Jersey: Princenton University Press. 2. Rau, S.S. 2009. *Engineering Optimization: Theory and Practice*. Fourth Edition. Hoboken, New York: John Wiley&Sons. 3. Boyd, S. 2004. *Convex Optimization*. Cambridge: Cambridge University Press. 4. Bartholomew-Biggs, M. 2008. *Nonlinear Optimization with Engineering Applications.* New York: Springer Science+Business Media, LLC.				

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1		✓								
CO2			✓							
CO3				✓						
CO4					✓					
CO5							✓			
CO6								✓		