



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: [math@ugm.ac.id](mailto:math@ugm.ac.id) Website: <http://math.fmipa.ugm.ac.id>

## Undergraduate Programme in Mathematics

Telp : +62 274 552243

Email : [maths1@ugm.ac.id](mailto:maths1@ugm.ac.id); [kaprodi-s1-matematika.mipa@ugm.ac.id](mailto:kaprodi-s1-matematika.mipa@ugm.ac.id)

[sekprodi-s1-matematika.mipa@ugm.ac.id](mailto:sekprodi-s1-matematika.mipa@ugm.ac.id)

Website : <http://s1math.fmipa.ugm.ac.id/>

## 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	3 <sup>th</sup> (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 (3 <sup>th</sup> 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: <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <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> </tbody> </table> The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.	No	Assessment methods (components, activities)	Weight (percentage)	1.	Final Examination	35	2.	Mid-Term Examination	30	3.	Quiz , Homework, Presentation, Laboratory work	35
No	Assessment methods (components, activities)	Weight (percentage)											
1.	Final Examination	35											
2.	Mid-Term Examination	30											
3.	Quiz , Homework, Presentation, Laboratory work	35											
Media employed	Projector, board, computer, e-learning via <a href="http://elisa.ugm.ac.id">http://elisa.ugm.ac.id</a> , win-QSB.												
Reading List	[1] Hamdy A. Taha, 1998, <i>Operation Research: an introduction</i> , Collier Mac Milan International Edition.												

	<p>[2] David R. Anderson, Dennis J. Sweeney, and Thomas A. William, 1985, <i>An Introduction to Management Sciences : Qualitative Approach to Decision Making, Fourth Edition</i>, South Western Educational Publishing</p> <p>[3] Wayne L. Winston, 2004, <i>Operation Research Application and Algorithms</i>, Ruxbury Press.</p> <p>[4] John A. Lawrence and Barry A. Pasternack, 2006, <i>Applied Management Science</i>, John Wiley &amp; Sons Inc.</p> <p>[5] Indarsih, 2016, Modul Praktikum Riset Operasi, Departemen Matematika, FMIPA, UGM.</p>
--	---

### CO and PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
<b>CO 1</b>		v							
<b>CO 2</b>					v				
<b>CO 3</b>					v		v		v
<b>CO 4</b>				v					