

# MODULE HANDBOOK

## OPERATIONS RESEARCH



**STATISTICS UNDERGRADUATE PROGRAM  
DEPARTMENT OF STATISTICS  
FACULTY OF SCIENCE AND DATA ANALYTICS  
INSTITUT TEKNOLOGI SEPULUH NOPEMBER  
SURABAYA**

## ENDORSEMENT PAGE



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OPERATIONS RESEARCH  
STATISTICS UNDERGRADUATE PROGRAM  
DEPARTMENT OF STATISTICS  
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Proses <i>Process</i>	Penanggung Jawab <i>Person in Charge</i>			Tanggal <i>Date</i>
	Nama <i>Name</i>	Jabatan <i>Position</i>	Tanda tangan <i>Signature</i>	
Perumus <i>Preparation</i>	Dr. Irhamah, S.Si., M.Si	Dosen <i>Lecturer</i>		
Pemeriksa dan Pengendalian <i>Review and Control</i>	Dr. Wibawati, S.Si, M.Si; Dr. Irhamah, S.Si., M.Si	Tim kurikulum <i>Curriculum team</i>		
Persetujuan <i>Approval</i>	Dr. Irhamah, S.Si., M.Si	Koordinator RMK <i>Course Cluster Coordinator</i>		
Penetapan <i>Determination</i>	Dr. Kartika Fithriasari, M.Si	Kepala Departemen <i>Head of Department</i>		

# MODULE HANDBOOK

## OPERATIONS RESEARCH

Module name	OPERATIONS RESEARCH	
Module level	Undergraduate	
Code	SS234746	
Course (if applicable)	OPERATIONS RESEARCH	
Semester	7	
Person responsible for the module	Dr. Irhamah, S.Si., M.Si	
Lecturer	Dr. Wibawati, S.Si, M.Si; Dr. Irhamah, S.Si., M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, elective, 7 <sup>th</sup> semester.	
Type of teaching, contact hours	Case method	
Workload	1. Lectures [L]: 3 x 50 = 150 minutes per week. 2. Exercises and Assignments [EA]: 3 x 60 = 180 minutes (3 hours) per week. 3. Independent Learning [IL]: 3 x 60 = 180 minutes (3 hours) per week.	
Credit points	3 credit points (SKS) Equivalent to 4.8 ECTS	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	CLO.1 Understand the concept of riskmanagement in finance CLO.2 Able to analyze the Company's financial statements (reports) CLO.3 Understand the Concept of Risk and Return CLO.4 Able to analyze and optimize portfolios	PLO-5 PLO-9
Content	Operations Research is a discipline that applies analytical tools based on quantitative methods for better decision-making. In this course are presented some fundamental methods and applications in various fields. Students are given an understanding of about the theory and basic concepts of Operations Research along with examples of real applications and their solutions. In addition, students are also equipped with advanced optimization concepts and procedures and apply them in management problems. The material provided includes Linear Program, Simplex Method, Duality, Sensitivity, Queue, Transportation Issues, Problems and Analysis of	

	Network Work and Goal Programming. The material is delivered through interactive lectures, discussions, exercises, and Problem Based Learning
Assessment and its weight	Assignment 1 (15%) Quiz (20%) Midterm Exam (25%) Final Project (35%)
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom
Reading list	<ol style="list-style-type: none"> <li>1. Bazaraa, M., Jarvis, J., dan Sherali, H. Linear Programming and Network Flows, 3rd Ed. John Wiley dan Sons, USA. 2005.</li> <li>2. Hillier, F. S. And Lieberman, G. J. Introduction to Operations Research, 6th Ed. McGraw-Hill, Inc. New York, USA. 1995.</li> <li>3. Taha, H. A. Operations Research: An Introduction, 8th Ed. Pearson Prentice Hall. New York, USA. 2007.</li> <li>4. Wayne, W. Operations Research, Fourth Edition, Brooks/Cole-Thomson Learning, USA. 2004.</li> <li>5. Montgomery, D.C., 2012. An Introduction to Optimization. 4th edition. USA: John Wiley and Sons Inc.</li> </ol>



**INSTITUT TEKNOLOGI SEPULUH NOPEMBER  
FAKULTAS SAINS DAN ANALITIKA DATA  
PROGRAM STUDI SARJANA STATISTIKA  
DEPARTEMEN STATISTIKA**

**RENCANA PEMBELAJARAN SEMESTER/  
SEMESTER LEARNING PLAN**


<b>MATA KULIAH (MK)/ Course</b>	<b>KODE/ Code</b>	<b>Rumpun MK/ Course Group</b>	<b>BOBOT (sks)/ Weight (credit)</b>		<b>SEMESTER/ Semester</b>	<b>Tgl Penyusunan/ Drafting Date</b>
<b>RISET OPERASI / OPERATIONS RESEARCH</b>	SS234746	Statistika Bisnis dan Industri	<b>T=3</b>	<b>P=0</b>	VII	Januari 2023
<b>OTORISASI/ AUTHORIZATION</b>	<b>Pengembang RPS/ RPS Developer</b>		<b>Koordinator RMK/ Course Group Coordinator</b>		<b>Ketua PRODI/ Head of Department</b>	
	Dr. Wibawati, S.Si, M.Si; Dr. Irhamah, S.Si., M.Si		Dr. Irhamah, S.Si., M.Si		Dr. Kartika Fithriasari, M.Si	
<b>Capaian Pembelajaran (CP)/ Learning Achievement</b>	<b>CPL-PRODI yang dibebankan pada MK/ PLO</b>					
	CPL-5 CPL-9	Mampu menerapkan teori statistika pada metode statistika Mampu menerapkan metode statistika dengan tepat serta mengevaluasinya untuk menganalisis permasalahan teoritis dan riil				
	<i>PLO-5 PLO-9</i>	<i>Able to apply statistical theory to statistical methods ble to apply statistical methods correctly and evaluate them to analyze theoretical and real problems</i>				
	<b>Capaian Pembelajaran Mata Kuliah (CPMK)/ CLO</b>					
	CPMK 1. Memahami konsep manajemen risiko di bidang keuangan CPMK 2. Mampu menganalisis laporan keuangan (report) Perseroan CPMK 3. Memahami Konsep Risiko dan Pengembalian CPMK 4. Mampu menganalisis dan mengoptimalkan portofolio					
	<i>CLO.1 Understand the concept of risk management in finance CLO.2 Able to analyze the Company's financial statements (reports)</i>					

	<p><i>CLO.3 Understand the Concept of Risk and Return</i>  <i>CLO.4 Able to analyze and optimize portfolios</i></p>																
	<p><b>Matrik CPL – CPMK</b>  <i>PLO-CLO Matrix</i></p> <table border="1"> <thead> <tr> <th></th> <th>CPL-5</th> <th>CPL-9</th> </tr> </thead> <tbody> <tr> <td>CPMK-1</td> <td>✓</td> <td></td> </tr> <tr> <td>CPMK-2</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>CPMK-3</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>CPMK-4</td> <td></td> <td>✓</td> </tr> </tbody> </table>			CPL-5	CPL-9	CPMK-1	✓		CPMK-2	✓	✓	CPMK-3	✓	✓	CPMK-4		✓
	CPL-5	CPL-9															
CPMK-1	✓																
CPMK-2	✓	✓															
CPMK-3	✓	✓															
CPMK-4		✓															
<p><b>Deskripsi Singkat MK/ Course Description</b></p>	<p>Riset Operasi adalah disiplin ilmu yang menerapkan alat analisis berdasarkan metode kuantitatif dalam pengambilan keputusan yang lebih baik. Dalam mata kuliah ini disajikan beberapa metode dan aplikasi mendasar di berbagai bidang. Mahasiswa diberikan pemahaman tentang teori dan konsep dasar Riset Operasi beserta contoh aplikasi nyata dan penyelesaiannya. Selain itu, mahasiswa juga dibekali dengan konsep dan prosedur optimasi lanjutan serta menerapkannya dalam masalah manajemen. Materi yang diberikan meliputi Linear Program, Simplex Method, Duality, Sensitivity, Queue, Transportation Issues, Problems and Analysis of network work dan Goal Programming. Materi disampaikan melalui ceramah interaktif, diskusi, latihan, dan Problem Based Learning</p> <p><i>Operations Research is a discipline that applies analytical tools based on quantitative methods for better decision-making. In this course are presented some fundamental methods and applications in various fields. Students are given an understanding of about the theory and basic concepts of Operations Research along with examples of real applications and their solutions. In addition, students are also equipped with advanced optimization concepts and procedures and apply them in management problems. The material provided includes Linear Program, Simplex Method, Duality, Sensitivity, Queue, Transportation Issues, Problems and Analysis of Network Work and Goal Programming. The material is delivered through interactive lectures, discussions, exercises, and Problem Based Learning</i></p>																
<p><b>Bahan Kajian: Materi Pembelajaran/ Course Material</b></p>	<p>Matematika, Pemrosesan Data, Metode Statistika  <i>Mathematics, Data Processing, Statistical Method</i></p>																
<p><b>Pustaka/ References</b></p>	<p><b>Utama/Primary:</b></p> <ol style="list-style-type: none"> <li>1. Bazaraa, M., Jarvis, J., dan Sherali, H. Linear Programming and Network Flows, 3rd Ed. John Wiley dan Sons, USA. 2005</li> </ol>																

	<b>Pendukung/Secondary:</b>						
	<ol style="list-style-type: none"> <li>Hillier, F. S. And Lieberman, G. J. Introduction to Operations Research, 6th Ed. McGraw-Hill, Inc. New York, USA. 1995.</li> <li>Taha, H. A. Operations Research: An Introduction, 8th Ed. Pearson Prentice Hall. New York, USA. 2007.</li> <li>Wayne, W. Operations Research, Fourth Edition, Brooks/Cole-Thomson Learning, USA. 2004.</li> <li>Montgomery, D.C., 2012. An Introduction to Optimization. 4th edition. USA: John Wiley and Sons Inc. Le, C. T. 1997. <i>Applied Survival Analysis</i>. John Wiley dan Sons, Inc.</li> </ol>						
<b>Dosen Pengampu/ Lecturers</b>	Dr. Wibawati, S.Si, M.Si; Dr. Irhamah, S.Si., M.Si						
<b>Matakuliah syarat/ Pre-requisite Course</b>	-						
<b>Mg Ke- Week</b>	<b>Kemampuan akhir tiap tahapan belajar (Sub-CPMK) Final capability for each learning step</b>	<b>Penilaian Evaluation</b>		<b>Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]</b>		<b>Materi Pembelajaran [Pustaka] Learning Material [References]</b>	<b>Bobot Penilaian (%) Evaluation Weight (%)</b>
		<b>Indikator Indicator</b>	<b>Kriteria &amp; Bentuk Criteria and Format</b>	<b>Luring Offline</b>	<b>Daring Online</b>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1		1.					
8	<b>ETS/Midterm</b>						

9							
16	<b>Evaluasi Akhir Semester / Ujian Akhir Semester/<i>Final Exam</i></b>						



	<b>RENCANA ASESMEN &amp; EVALUASI</b> <i>Assessment and Evaluation Plan</i> Program Studi Sarjana Statistika / <i>Statistics Undergraduate Program</i> <b>RISET OPERASI / OPERATIONS RESEARCH</b>		<b>RA&amp;E</b>
			SLK-46
<b>Kode MK:</b> SS234746  <i>Course Code:</i> SS234746	<b>Bobot sks (T/P): 3</b>  <i>CREDITS : 3</i>	<b>Rumpun MK:</b> Statistika Bisnis dan Industri  <i>Course cluster:</i> Business and Industrial Statistics	Smt: VII  <i>Semester VII</i>
<b>OTORISASI</b> <i>AUTHORIZATION</i>	<b>Penyusun</b> <i>Author</i>  Dr. Wibawati, S.Si, M.Si; Dr. Irhamah, S.Si., M.Si	<b>Koordinator RMK</b> <i>Coordinator of course cluster</i>  Dr. Irhamah, S.Si., M.Si	<b>Kaprodi</b> <i>Head of Department</i>  Dr. Kartika F, M.Si.

Mg ke (1)	Sub CP-MK (2)		Bentuk Asesmen (Penilaian) / <i>Evaluation Type</i> (3)	Bobot / <i>Scoring</i> (%) (4)
	No	Kemampuan akhir / <i>Final Capability</i>		
1				
8		Evaluasi Tengah Semester <i>Mid Semester Evaluation</i>		
9				
16		Evaluasi Akhir <i>Final Evaluation</i>		
<b>Total Bobot Penilaian</b>				<b>100%</b>