



**UNIVERSITAS INDONESIA**  
Faculty of Mathematics and Natural Sciences  
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### MODULE HANDBOOK

Module designation	<i>Network Optimization</i>
Semester(s) in which the module is taught	6
Person responsible for the module	<i>Zuherman Rustam</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Lectures, group discussions</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 8.5 hours x 14 weeks + 3 hours x 2 weeks</i> <i>Contact hours: 2.5 hours lectures per week</i> <i>Private study including examination preparation, specified in hours<sup>1</sup>:</i> <i>3 hours structured activities, and 3 hours individual study per week</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	<ul style="list-style-type: none"><li>- <i>Mathematical programming</i></li><li>- <i>Discrete Mathematics</i></li></ul>
Module objectives/intended learning outcomes	<i>After completing the course, students have the ability to identify the characteristic features of a network optimization, and implement an appropriate algorithm to solve the problems.</i>

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	<ol style="list-style-type: none"> <li>1. <i>Definition of a network and its features</i></li> <li>2. <i>Design and analyze a network</i></li> <li>3. <i>Shortest path algorithm</i></li> <li>4. <i>Minimum spanning tree algorithm</i></li> <li>5. <i>Maximum and minimum cost flows algorithm</i></li> <li>6. <i>Generalization of flows problem</i></li> <li>7. <i>Multicommodity flows</i></li> </ol>																				
Examination forms	<ol style="list-style-type: none"> <li>1. <i>Class activities : Quiz, homework</i></li> <li>2. <i>Group discussion sessions</i></li> <li>3. <i>Mid-term examination</i></li> <li>4. <i>Final examination</i></li> </ol>																				
Study and examination requirements	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> <li>1. <i>Homework (20%).</i></li> <li>2. <i>Written Quiz (20%).</i></li> <li>3. <i>Mid-term examination (30%).</i></li> <li>4. <i>Final examinations (30%).</i></li> </ol> <p><i>To successfully pass the module it requires a minimum 55% of the total mark.</i></p> <table data-bbox="628 972 991 1464"> <thead> <tr> <th><i>Mark</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>85–100</td> <td>A</td> </tr> <tr> <td>80–&lt;85</td> <td>A-</td> </tr> <tr> <td>75–&lt;80</td> <td>B+</td> </tr> <tr> <td>70–&lt;75</td> <td>B</td> </tr> <tr> <td>65–&lt;70</td> <td>B-</td> </tr> <tr> <td>60–&lt;65</td> <td>C+</td> </tr> <tr> <td>55–&lt;60</td> <td>C</td> </tr> <tr> <td>40–&lt;55</td> <td>D</td> </tr> <tr> <td>&lt;40</td> <td>E</td> </tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	85–100	A	80–<85	A-	75–<80	B+	70–<75	B	65–<70	B-	60–<65	C+	55–<60	C	40–<55	D	<40	E
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Reading list	<p><i>R. K. Ahuja, T. L. Magnanti, dan J. B. Orlin, Network flows: theory, algorithms, and applications. Prentice-Hall, Inc., 1993.</i></p>																				