



UNIVERSITAS INDONESIA
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MODULE HANDBOOK

Module designation	<i>Optimal control theory</i>
Semester(s) in which the module is taught	7
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 hours¹:</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">- <i>Mathematical programming</i>- <i>Ordinary differential equations</i>
Module objectives/intended learning outcomes	<i>After completing the course, students have the ability to identify the characteristic of an optimal control problem, and implement a proper method to solve the problem.</i>

¹ 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"> 1. <i>Transversality conditions</i> 2. <i>Autonomous system</i> 3. <i>Diagram analysis</i> 4. <i>Type of endpoints</i> 5. <i>Application of optimal control theory to investment and advertising problem</i> 6. <i>Pontryagin principle</i> 7. <i>Dynamic programming</i> 8. <i>Stochastic optimal control problem</i> 																				
Examination forms	<ol style="list-style-type: none"> 1. <i>Class activities : Quiz, homework</i> 2. <i>Group discussion sessions</i> 3. <i>Mid-term examination</i> 4. <i>Final examination</i> 																				
Study and examination requirements	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> 1. <i>Homework (20%).</i> 2. <i>Written Quiz (20%).</i> 3. <i>Mid-term examination (30%).</i> 4. <i>Final examinations (30%).</i> <p><i>To successfully pass the module it requires a minimum 55% of the total mark.</i></p> <table data-bbox="628 1052 997 1534"> <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—<85</td> <td>A-</td> </tr> <tr> <td>75—<80</td> <td>B+</td> </tr> <tr> <td>70—<75</td> <td>B</td> </tr> <tr> <td>65—<70</td> <td>B-</td> </tr> <tr> <td>60—<65</td> <td>C+</td> </tr> <tr> <td>55—<60</td> <td>C</td> </tr> <tr> <td>40—<55</td> <td>D</td> </tr> <tr> <td><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>Kamien, M. I. dan Schwartz, N. L. (1991). Dynamic optimization: The calculus of variations and optimal control in economics and management. Amsterdam: North-Holland.</i></p>																				