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Faculty of Mathematics and Natural Sciences
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MODULE HANDBOOK

Module designation	<i>Linear Algebra 2</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Kiki Ariyanti, Ph.D.</i>
Language	<i>Indonesia</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Flipped Class and Problem based learning using E-learning</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 170 minutes</i> <i>Contact hours (please specify whether lecture, exercise, laboratory session, etc.):</i> <i>Private study including examination preparation, specified in hours¹:</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	<i>Linear Algebra, Algebra</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.

<p>Module objectives/intended learning outcomes</p>	<ol style="list-style-type: none"> 1. <i>The students can explain the algebraic structure and its relation, Vector Spaces, Linear Transformations, Matrix Representation of Linear Transformations of Inner Product Spaces, Eigen Values and Vectors, Singular Value Decomposition, Cayley-Hamilton Theorem, Jordan Forms, and Module Introduction.</i> 2. <i>The students can use definitions and theorems in proving the properties of algebraic structures in vector spaces and linear transformations. Students can determine the matrix representation of a given linear transformation.</i> 3. <i>The students can explain the inner product space and its properties.</i> 4. <i>The students can determine the values and eigenvectors of a given linear transformation representation matrix.</i> 5. <i>The students can explain properties related to endomorphism decomposition</i> 6. <i>The students can explain the simple nature of the module.</i> 7. <i>The students can re-proven theorems and proofs of properties and theorems in linear algebra related to their algebraic structure.</i> 																				
<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Vector Space</i> 2. <i>Linear Transformations, Representation Matrices of Linear Transformations</i> 3. <i>Inner Product Spaces</i> 4. <i>Eigenvalues and Eigenvectors</i> 5. <i>Decomposition of Singular Value, Cayley-Hamilton Theorem, Jordan Form</i> 6. <i>An Introduction to module</i> 																				
<p>Examination forms</p>	<p><i>Essay</i></p>																				
<p>Study and examination requirements</p>	<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 minimum 55% of the total mark.</i></p> <table data-bbox="619 1473 880 1921"> <thead> <tr> <th><i>Mark</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td><i>85–100</i></td> <td><i>A</i></td> </tr> <tr> <td><i>80–<85</i></td> <td><i>A-</i></td> </tr> <tr> <td><i>75–<80</i></td> <td><i>B+</i></td> </tr> <tr> <td><i>70–<75</i></td> <td><i>B</i></td> </tr> <tr> <td><i>65–<70</i></td> <td><i>B-</i></td> </tr> <tr> <td><i>60–<65</i></td> <td><i>C+</i></td> </tr> <tr> <td><i>55–<60</i></td> <td><i>C</i></td> </tr> <tr> <td><i>40–<55</i></td> <td><i>D</i></td> </tr> <tr> <td><i><40</i></td> <td><i>E</i></td> </tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	<i>85–100</i>	<i>A</i>	<i>80–<85</i>	<i>A-</i>	<i>75–<80</i>	<i>B+</i>	<i>70–<75</i>	<i>B</i>	<i>65–<70</i>	<i>B-</i>	<i>60–<65</i>	<i>C+</i>	<i>55–<60</i>	<i>C</i>	<i>40–<55</i>	<i>D</i>	<i><40</i>	<i>E</i>
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Reading list	<ol style="list-style-type: none">1. <i>Robert J. Valenza, Linear Algebra: An Introduction to Abstract Mathematics, Springer, 1993</i>2. <i>Ahmad Arifin, Aljabar Linier, edisi II, 2001, Penerbit ITB.</i>3. <i>Bill Jacob, Linear algebra, 1990, W.H. Freeman and Company.</i>4. <i>Paul R. Halmos, Finite Dimensional Vector Spaces, 1987, Springer-Verlag.</i>
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