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MODULE HANDBOOK

Module name	Linear Algebra
Module level, if applicable	Bachelor
Code, if applicable	MMM-2202
Subtitle, if applicable	-
Courses, if applicable	Linear Algebra
Semester(s) in which the module is taught	4th (fourth)
Person responsible for the module	Chair of the Lab. of Algebra
Lecture	Dr. Ari suparwanto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory course in the second year (4th semester) Bachelor Degree
Type of teaching, contact hours	100 minutes lecturers and 120 minutes structured activities (homework and task) 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, and 170 minutes laboratory work per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	3
Requirements according to the examination regulations	Students have taken Linear Algebra course (MMM-2202) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken the module of Elementary Linear Algebra (MMM-1202), Introduction to Algebraic Structure II (MMM-2201), and have participated in the final exam of the module.
Module objectives/intended learning outcomes	After completing this course the students have: CO 1. ability to do mathematical proof in connection with some concept in linear algebra CO 2. problem solving skills by using procedures in linear algebra.
Content	a. Vector Spaces, Subspace, linear combinations, Spanning Sets and Linear Independence, Basis and Dimension. b. Linear Transformation, Kernel and Image, the Matrix of Linear Transformation, Similarity. c. Inner Product Spaces, Norm and Distance, Orthogonality, Orthogonal dan Orthonormal Basis, Gram-Schmidt Orthogonalization Process. d. Invariant Subspaces, Direct Sums, the Cayley-Hamilton Theorem.
Study and examination requirements and forms of examination	The final mark will be weighted as follows: No — Assessment methods (components, activities) — Weight (percentage) 1 — Final Examination — 40% 2 — Mid-Term Examination — 30% 3 — Class Activities: Quiz, Homework, etc. — 30% The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	Board, LCD Projector, Laptop/Computer
Reading List	1. Serge Lang, 1972, *Linear Algebra*, Addison-Wesley Publishing Co., London.

	2. Howard Anton, and Chris Rorres, 2000, *Elementary Linear Algebra, Applications Version,* Eight Edition, John Wiley and Sons, Inc., New York. 3. Morton L. Curtis, 1990, *Abstract Linear Algebra*, Springer-Verlag, New York. 4. Bill Jacob, 1990, *Linear Algebra*, W.H. Freeman and Co., New York. 5. Keith Nicholson, 2001, *Elementary Linear Algebra*, McGraw-Hill Book Co., Singapore. 6. David C. Lay, 2012, *Linear Algebra and Its Applications*, 4th Edition Linear Algebra and Its Applications, Addison Wesley. http://web.stanford.edu/class/nbio2281/handouts/Linear%20Algebra_David%20Lay.pdf 7. Carl D. Meyer, 2000, *Matrix Analysis and Applied Linear Algebra*, SIAM http://saba.kntu.ac.ir/eecd/sedghizadeh/Ebooks/Matrix_Analysis.pdf

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			v			v			v
CO 2			v						