UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Mathematics Department
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Undergraduate Programme in Mathematics
Telp : +62 274 552243
Email : maths1@ugm.ac.id; kaprodi-s1-matematika.mipa@ugm.ac.id
sekprodi-s1-matematika.mipa@ugm.ac.id
Website : http://s1math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module name	Numerical Linear Algebra
Module level, if applicable	Bachelor
Code, if applicable	MMM-3208
Subtitle, if applicable	-
Courses, if applicable	Numerical Linear Algebra
Semester(s) in which the module is taught	5th (fifth)
Person responsible for the module	Chair of the Lab. of Algebra and Chair of the Lab. of Mathematical Computation
Lecture(s)	Dr. Ari Suparwanto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Bachelor Degree, Elective, 5th semester
Type of teaching, contact hours	150 minutes lectures, 180 minutes structured activities.
Workload	150 minutes lectures, 180 minutes structured activities, 180 minutes individual study, 16 weeks per semester (including mid-term and final examinations), 136 hours per semester.
Credit points	3(1)
Requirements according to the examination regulations	Students have taken Numerical Linear Algebra course (MMM-3208) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken Linear Algebra course (MMM-2202) and have participated in the final examination of the course.
Module objectives/intended learning outcomes	After completing this course, the students have ability to: CO 1. work on the decomposition of the matrix (LU factorization, Jordan Canonical Form, QR factorization, Main Axis Theorem, Schur Theorem, Cholesky Factorization, SVD, etc.). CO 2. do calculation using MATLAB due the topic under discussion. CO 3. find a solution of some real problems related to the topic under discussion.
Content	a. Triangular matrix and its properties, factorization LU. b. Matrix Orthogonal and its properties, Diagonalization. c. Principle Axis Theorem, Theorem Schur, Factorization QR. d. Positive definite matrix and its properties, Factorization Cholesky. e. Matrix Hermit and matrix Unitary and its properties, Unitary Diagonalization. f. Singular Value Decomposition (SVD) and Polar Decomposition.
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 — 30 2 — Mid-Term Examination — 25 3 — Laboratory — 25 4 — Class Activities: Quiz, Homework, etc. — 20 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. Keith Nicholson, 2001, *Elementary Linear Algebra*, McGraw-Hill Book Co., Singapore. 2. John T. Scheick, 1997, *Linear Algebra with Applications,* McGraw-Hill International Editions.

	3. Lloyd N. Trefethen, dan David Bau, III, 1997, *Numerical Linear Algebra*, SIAM, Philadelphia. 4. Xiao-Qing **JIN** and Yi-Min WEI, 2008, *Numerical Linear Algebra And Its Applications*, 5. David S. Watkins, 2002, *Fundamentals of Matrix Computations*, 2nd Ed, John Wiley and Sons, https://davidtabora.files.wordpress.com/2015/01/david_s-_watkins_fundamentals_of_matrix_computat.pdf 6. John Penny, 1995, *Numerical Methods Using MATLAB*, Ellis Horwood. 7. Cleve Barry Moler, 2004, *Numerical Computing with MATLAB,* SIAM, Philadelphia

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			
CO 2				v		v			
CO 3		v							