### 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(I)  
**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 L.U.  
- 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**:  

### PLO and CO Mapping

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