

**UNIVERSITAS GADJAH MADA**

Faculty of Mathematics and Natural Sciences

Mathematics Department

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**Undergraduate Programme in Mathematics**

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**MODULE HANDBOOK**

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| Module name | Applied Linear Algebra II |
| Module level, if applicable | Bachelor |
| Code, if applicable | MMM-3209 |
| Subtitle, if applicable |  |
| Courses, if applicable |  |
| Semester(s) in which the module is taught | Third year (Even semester). |
| Person responsible for the module | Chair of the Lab. of Algebra |
| Lecturer(s) | Dr. Indah Emilia Wijayanti |
| Language | Bahasa Indonesia |
| Relation to curriculum | Elective Course |
| Type of teaching, contact hours | 150 minutes lecture, 180 minutes supervised activities |
| 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, 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 Applied Linear Algebra II course (MMM-3209) and have an examination card where the course is stated on. |
| Recommended prerequisites | Students have taken Introduction to Linear Algebra course (MMM-2202) and have participated in the final examination of the course. |
| Module objectives/intended learning outcomes | Upon successful completion, students have ability to:1. apply linear algebra concept to solve some linear transformation problems;
2. apply linear algebra concept to solve some operator problems;
3. apply linear algebra concept to analyze further representation matrices.
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| Content | 1. Eigenvalues, eigenvectors, eigenspace, characteristic polyinomials.
2. Diagonalization operators, similarity.
3. Differential matrices first order, eigenvalues estimation.
4. Adjoint operators, Spectral Theorem and applications.
5. Generalized eigenvalues, Hermit operator extreme problems.
6. Bilinear forms, representation matrices of bilinear forms and diagonalization.
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| Study and examination requirements and forms of examination |

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| The final mark will be weighted as follows:No Assessment methods (components, activities) Weight (percentage)1 Final Examination 35% – 45% 2 Mid-Term Examination 30% – 35%3 Class Activities: Quiz, Homework, etc 25% – 30%The initial cut‐off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively. |

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| Media employed | Boards, projectors. |
| Reading List | 1. John T. Scheick, 1997, *Linear Algebra with Applications,* McGraw-Hill International Editions.
2. Steven Roman, 2008, *Advanced Linear Algebra*, Springer, New York.
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**PLO and CO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **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 |  |  | v |  |