UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS EDUCATION
**PHYSICS STUDY PROGRAM**
Colombo St. Number 1 Yogyakarta 55281
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| Module name: | Linear Algebra for Physics |
| Module level, if applicable: | Undergraduate |
| Code: | FSK6303 |
| Sub-heading, if applicable: | - |
| Classes, if applicable: | - |
| Semester: | 3 |
| Module coordinator: | Bambang Ruwanto, M.Si. |
| Lecturer(s): | Bambang Ruwanto, M.Si. |
| Language: | Bahasa Indonesia |
| Classification within the curriculum: | Compulsory Course |
| Teaching format / class hours per week during the semester: | 150 minutes lectures, 180 minutes structured activities, and 180 minutes individual study per week |
| Workload: | Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes individual study per week for 16 weeks. |
| Credit points: | 3 SKS (4.86 ECTS) |
| Prerequisites course(s): | - |
| Course Outcomes | CO1. Mampu menganalisis fenomena fisika dengan bantuan vektor<br>analyze physical phenomena using vectors<br><br>CO2. Mampu menyelesaikan persamaan matematis dari suatu fenomena fisika yang mengandung sistem persamaan linear<br>solve mathematical equations of a physical phenomenon that contains a system of linear equations |

<table>
<tr><td></td><td>CO3. Mampu menyelesaikan persamaan matematis dari suatu fenomena fisika yang mengandung operasi matriks<br>solve mathematical equations of a physical phenomenon containing matrix operations<br><br>CO4. Mampu menganalisis eigenvalue dan eigenvektor dari suatu fenomena fisika<br>analyze the eigenvalues and eigenvectors of a physical phenomenon<br><br>CO5. Mampu menganalisis sifat ortogonalitas dari suatu fenomena fisika<br>analyze the orthogonality of a physical phenomenon<br><br>CO6. Mampu menganalisis suatu fenomena fisika menggunakan konsep ruang vektor.<br>analyze a physical phenomenon using the concept of vector space.</td></tr>
<tr><td>Content:</td><td>Mata kuliah ini membahas Vektor, Sistem Persamaan Linear, Matriks, Eigen Value dan Eigen Vektor, Sifat-sifat Ortogonalitas, Ruang Vektor.<br>This course discusses Vectors, Systems of Linear Equations, Matrices, Eigen Values and Eigen Vectors, Orthogonality Properties, Vector Spaces.</td></tr>
<tr><td>Study / exam achievements:</td><td>Penilaian sikap dilakukan pada setiap pertemuan dengan melakukan observasi dan/atau penilaian masing-masing individu dengan asumsi bahwa setiap mahasiswa memiliki sikap baik. Mahasiswa diberi nilai sikap amat baik apabila ia menunjukkan sikap yang lebih baik jika dibandingkan mahasiswa pada umumnya. Hasil penilaian sikap tidak masuk dalam komponen nilai akhir, tetapi merupakan syarat lulus mata kuliah. Mahasiswa lulus mata kuliah ini jika sekurang-kurangnya memiliki sikap baik.<br><br>Nilai akhir diberi bobot sebagai berikut
<table>
<tr><th>No</th><th>CO</th><th>Komponen Penilaian</th><th>Teknik Penilaian</th><th>Weight</th></tr>
<tr><td>1</td><td>CO1,<br>CO2,<br>CO3,<br>CO4,<br>CO5,<br>dan<br>CO6</td><td>a. Individual Assigntment<br>b. Group Assignment (Case Study)<br>c. Quiz<br>d. Mid<br>e. Final Exam</td><td>Written Test</td><td>15%<br><br>15%<br><br><br>15%<br>25%<br>30%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
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| Forms of media: | Board, LCD Projector, Laptop/Computer |
| Literature: | A. Howard Anton. (2010). *Elementary Linear Algebra*. New York: John Wiley and Sons.<br>B. David Poole. (2015). *Linear Algebra a Modern Introduction* (4th Edition). Stamford: Cengage Learning.<br>C. Vittoria Bonanzinga. *Some Application of Linear Algebra and Geometry in Real Life*.<br>D. https://www.sciencedirect.com/journal/linear-algebra-and-its-applications |

**PLO and CO Mapping**

| | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 | PLO9 |
|---|---|---|---|---|---|---|---|---|---|
| **CO1** | | | √ | | | | | | |
| **CO2** | | | √ | | | | | | |
| **CO3** | | | √ | | | | | | |
| **CO4** | | | √ | | | | | | |
| **CO5** | | | √ | | | | | | |
| **CO6** | | | √ | | | | | | |