UIN SUNAN KALIJAGA YOGYAKARTA
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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Mathematical Physics II
Module level, if applicable	Bachelor
Code, if applicable	FIS414008
Subtitle, if applicable	-
Courses, if applicable	Mathematical Physics II
Semester(s) in which the module is taught	2nd (second)
Person responsible for the module	Anis Yuniati, M.Si., Ph.D.
Lecturer(s)	Anis Yuniati, M.Si., Ph.D.
Language	Indonesia
Relation to curriculum	compulsory course in the first year (2nd semester) Bachelor Degree
Type of teaching, contact hours	200 minutes lectures and 240 minutes structured activities per week.
Workload	Total workload is 181.3 hours per semester, which consists of 200 minutes lectures per week for 14 weeks, 240 minutes structured activities per week, 240 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	4
Requirements according to the examination	Minimum attendance 75% All assignments submitted Attendance on time
Recommended prerequisites	Basic Mathematics
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Able to identify the form of ordinary differential equations and partial differential equations and find solutions to each form of ordinary differential equations and partial differential forms CO 2. Able to analyse various cases in calculus of variations CO 3. Able to describe special functions and find series solutions of differential equations CO 4. Able to understand complex variable functions, probability and statistics
Content	1. Ordinary Differential Equations, Solution of PDB, Separation of variables, nonhomogeneous PD, solution of PD by series, Frobenius method 2. Calculus of Variations: Euler's equation, Lagrange's equation 3. Special functions : Gamma function, beta function, error function, elliptic integral. 4. Legendre function, Bessel function, Hermitte function, Laguerre function, orthogonal function, recursion relation, Legendre series 5. Partial Differential Equations, Wave equation, Laplace and Poisson equations, Heat propagation and diffusion equations, Solution using separation of variables method

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<table>
<tr><td></td><td>6. Analytic Functions, Contour Integral, Lauren series, Residue technique, Conformal mapping
7. Probability, Sample space, Counting methods, Random variables, Continuous distribution, Normal (Gaussian) distribution, Binomial distribution, Poisson distribution</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>The final mark will be weighted as follows:
<table>
<tr><th>NO</th><th>Assessment methods (components, activities)</th><th>Weight (percentage)</th></tr>
<tr><td>1</td><td>Final Examination</td><td>40%</td></tr>
<tr><td>2</td><td>Mid-Term Examination</td><td>30%</td></tr>
<tr><td>3</td><td>Class Activities : Quiz, Homework, etc.</td><td>30%</td></tr>
</table>
The final assessment is expressed in the form of a letter value converted from a number value with the following categories:
<table>
<tr><th>NO</th><th>Number Value</th><th>Letter Value</th><th>NO</th><th>Number Value</th><th>Letter Value</th></tr>
<tr><td>1</td><td>≥ 95</td><td>A</td><td>7</td><td>65-69.99</td><td>B/C</td></tr>
<tr><td>2</td><td>90-94.99</td><td>A-</td><td>8</td><td>60-64.99</td><td>C+</td></tr>
<tr><td>3</td><td>85-89.99</td><td>A/B</td><td>9</td><td>55-59.99</td><td>C</td></tr>
<tr><td>4</td><td>80-84.99</td><td>B+</td><td>10</td><td>50-54.99</td><td>C-</td></tr>
<tr><td>5</td><td>75-79.99</td><td>B</td><td>11</td><td>55-34.99</td><td>D</td></tr>
<tr><td>6</td><td>70-74.99</td><td>B-</td><td>12</td><td><35</td><td>E</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>Whiteboard, markers, LCD projector, laser pointer, power point presentation, laptop/PC</td></tr>
<tr><td>Reading list</td><td>1. Mathematical Methods in The Physical Sciences, Mary L. Boas, 3rd edition, John Wiley & Sons
2. Mathematical Methods For Physicist, George B. Arfken and Hand J. Weber, 7th edition, Academic Press
3. Mathematical Methods For Physics and Engineering, K.F.Riley, M.P.Hobson, and S.J.Bence, 3rd edition, Cambridge University Press</td></tr>
</table>

PLO and CO Mapping

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