



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS EDUCATION
PHYSICS STUDY PROGRAM

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Bachelor of Physics

MODULE HANDBOOK

Module name:	Differential Equations for Physics
Module level, if applicable:	Undergraduate
Code:	FSK6304
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	2
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:	100 minutes lectures, 120 minutes structured activities, and 120 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 menyelesaikan persamaan matematis dari fenomena fisika yang mengandung persamaan differensial biasa orde satu dan dua solve mathematical equations of physical phenomena containing ordinary differential equations of first and second order

	<p>CO2. Mampu menganalisis fenomena fisika dengan deret Fourier dan transformasinya analyze physical phenomena with Fourier series and its transformation</p> <p>CO3. Mampu menyelesaikan persamaan matematis dari fenomena fisika yang mengandung persamaan differensial parsial (Persamaan Laplace, persamaan difusi, persamaan gelombang, persamaan Poisson) solve mathematical equations of physical phenomena containing partial differential equations (Laplace equation, diffusion equation, wave equation, Poisson equation)</p> <p>CO4. Mampu menyelesaikan persamaan differensial menggunakan solusi deret (Polinomial Legendre dan polinomial Bessel). solve differential equations using series solutions (Legendre polynomials and Bessel polynomials)</p> <p>CO5. Mampu menyelesaikan persamaan differensial menggunakan transformasi Laplace. solve differential equations using Laplace transformasi transformation</p>																
Content:	<p>Mata kuliah ini membahas Persamaan Diferensial Orde Satu dan Orde Dua, Deret Fourier, Persamaan Diferensial Parsial, Solusi Persamaan Diferensial dengan Deret, dan Solusi Persamaan Diferensial dengan Transformasi Laplace. This course discusses First Order and Second Order Differential Equations, Fourier Series, Partial Differential Equations, Solutions of Differential Equations with Series, and Solutions of Differential Equations with Laplace Transform.</p>																
Study / exam achievements:	<p>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.</p> <p>Nilai akhir diberi bobot sebagai berikut</p> <table border="1" data-bbox="571 1709 1391 2009"> <thead> <tr> <th>No</th> <th>CO</th> <th>Komponen Penilaian</th> <th>Teknik Penilaian</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1</td> <td rowspan="4">CO1, CO2, CO3, CO4, dan CO5</td> <td>a. Individual Assignment</td> <td rowspan="4">Presentasi/tes tertulis</td> <td>15%</td> </tr> <tr> <td>b. Group Assignment (Case Study)</td> <td>15%</td> </tr> <tr> <td>c. Quiz</td> <td>15%</td> </tr> <tr> <td>d. Mid</td> <td>25%</td> </tr> </tbody> </table>	No	CO	Komponen Penilaian	Teknik Penilaian	Weight	1	CO1, CO2, CO3, CO4, dan CO5	a. Individual Assignment	Presentasi/tes tertulis	15%	b. Group Assignment (Case Study)	15%	c. Quiz	15%	d. Mid	25%
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		b. Group Assignment (Case Study)		15%													
		c. Quiz		15%													
		d. Mid		25%													

		e. Final Exam		30%
	Total			100%
Forms of media:	Board, LCD Projector, Laptop/Computer			
Literature:	<p>A. Belkacem Said-Houari. (2015). <i>Differential Equations</i>. New York: Springer Cham Heidelberg.</p> <p>B. Mary L. Boas. (2005). <i>Mathematical Methods in the Physical Sciences</i> (3rd Edition). New York: John Wiley and Sons.</p> <p>C. George B. Arfken. (1995). <i>Mathematical Methods for Physicists</i> (fourth edition). New York: Academic Press.</p> <p>D. Dass, H.K. (2010). <i>Mathematics for Engineers</i>. New Delhi: S. Chand and Company.</p>			

PLO and CO Mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
CO1			√						
CO2			√						
CO3			√						
CO4			√						
CO5			√						