

Module Handbook

Module Name:	Mathematical Physics II
Module Level:	Bachelor
Abbreviation, if applicable:	FI 2201
Sub-heading, if applicable:	
Courses included in the module, if applicable:	
Semester/term:	4/ second year
Module coordinator(s):	
Lecturer(s):	
Language:	Bahasa Indonesia
Classification within the curriculum:	General Studies / Major Subject / Elective Studies
Teaching format / class hours per week during the semester:	4 hours lecture
Workload:	4 hours lectures, 8 hours individual study, 16 weeks per semester, and total 192 hours a semester
Credit Points:	4
Requirements:	Mathematics IA, Mathematics IIA, Elementary Physics IA, Elementary Physics IIA
Learning goals:	<p>Knowledge:</p> <ol style="list-style-type: none"> 1. To be able understanding the Euler equation of mathematical problem, either for two or many variables and the application to the Lagrange equation 2. Understand and knowing the definition of the Gamma function, Factorial Function, Beta Function, Error Function and Elliptic Function 3. Knowing and understanding the Legendre and the Bessel functions and its applications 4. To understand how to analyze the complex functions <p>Skill:</p> <ol style="list-style-type: none"> 1. To have ability to perform coordinate transformations, from Cartesian coordinates to curvilinear coordinates or vice versa and also to be able using Vector Differential Operators (grad, div and curl and Laplacian) in Curvilinear Coordinates System. 2. To able solving a differential equations in series solution and the method of Frobenius 3. To be able solving partial differential equations (Laplace, diffusion, Poisson, Wave and Helmholtz)
Content:	Calculus of Variations, Coordinate Transformation, Special Functions (Gamma function, Beta function, elliptic functions, Error functions), Differential Equations with Series Solutions (including Legendre functions and Bessel functions), Partial Differential Equations, Complex Functions
Study/exam achievements:	Students are considered to be competent and pass if at least get 50% of maximum mark of the exams, homework, quizzes
Forms of Media:	Slides and LCD projectors, blackboards
Literature:	<ol style="list-style-type: none"> 1. Boas, M. L., Mathematical Methods in the Physical Sciences, 3rd ed., John Wiley, 2005. 2. Arfken, G. B. dan Weber, H.J., Mathematical Methods for Physicist, 5th ed., Academic Press, 1995.
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