UNIVERSITAS NEGERI YOGYAKARTA
F A K U L T A S   M I P A

SILABI

Faculty : Mathematics and Natural Sciences
Study Program : Mathematics Education
Course & Code : Differential Equations, MAA 313
Credit : Theory = 2, Practice = 1
Semester : IV
Prerequisite & Kode : Advanced Calculus, MAA 312
Lecturer : Dr. Hartono

I. Course description

This course contain clasifications and solutions of differential equation, first order differential equations, separable equations, homogeneous equations, Bernoulli equations, modelling with first order equations, exact equations and integrating factor, autonomus differential equations, homogeneous linear second order with constant coefficient, characteristics equation, Wronskian determinant, principal of superposition, complex root of the characteristic equations, repeated root of the characteristic equations, nonhomogeneous linear second order with constant coefficient, variation of parameter method, forced vibrations, and introduction of system of first order linear differential equations.

II. Standard Competency

Students able to

a. explaine the concepts of clasifications and solutions of differential equation, first order differential equations, separable equations, homogeneous equations , Bernoulli equations , modelling with first order equations, exact equations and integrating factor, autonomus differential equations, homogeneous linear second order with constant coefficient, characteristics equation, Wronskian determinant, principal of superposition, complex root of the characteristic equations, repeated root of the characteristic equations, nonhomogeneous linear second order with constant coefficient, variation of parameter method, forced vibrations, and introduction of system of first order linear differential equations.

b. solve the problems that related to first and second order differential equations

III. Planning

Meeting	Basic competence	subject	Strategy	Reference
1-2	To explaine the concepts of clasifications and solutions of differential equation	1. clasifications of differential equation, 2. solutions of differential equation	Expository, Discussion	p. 10-26
3-4	To explaine the first order differential equations	1. the first order differential equations	Discussion and Task	p.31-42
5-6	To explaine the separable equations and homogeneous equations	1. separable equations 2. homogeneous equations	Discussion and presentation	p: 42-49
7	To explaine the concepts of Bernoulli equations	Bernoulli equations	Discussion and Task	p. 77-79
8-10	To explaine the modelling with first order equations	1. modelling with first order equations	Discussion and Task, presentation	p: 50-68

Meeting	Basic competence	subject	Strategy	Reference
11-13	To explaine the exact equations and integrating factor	1. exact equations 2. integrating factor	Discussion and Task, presentation	p.94-100
14-16	To explaine the concepts autonomus differential equations	autonomus differential equations	Discussion and Task	p: 83-90
17-18	**Mid semester and review**			
19-20	To explaine the homogeneous linear second order with constant coefficient	1. homogeneous linear second order with constant coefficient	Discussion and Task	p: 137-145
21-22	To explaine the concepts of Wronskian determinant	Wronskian determinant	Discussion, presentation and Task	p: 145-157
23	To explaine the concept of principal of superposition	principal of superposition	Discussion and Task	p.145-148
24-25	To explaine the concept of complex root of the characteristic equations	complex root of the characteristic equations	Discussion and Task	p: 157-166
26-27	To explaine the concept of repeated root of the characteristic equations	repeated root of the characteristic equations	Discussion and Task,	p.166-173
28-30	To explaine the variation of parameter method and forced vibration	1. Variation of parameter method 2. forced vibrations	Discussion and Task, presentation	p.185-201
31-32	To explaine introduction of system of first order linear differential equations.	introduction of system of first order linear differential equations.	Discussion and Task	p.355-362

IV. Refference

Boyce, W. E. and DiPrima, R.C. 2009. *Elementary Differential Equations and Boundary Value Problems, 9th ed.* U.S.A: John Wiley and Sons Inc

V. Evaluation

No.	Component	Bobot (%)
1.	Activities	20%
2.	Task	25%
3.	Mid Semester	25%
4.	Final Test	30%
	Total	100%

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