Department of Mathematics
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Course	**Course Name**	**: Numerical Differential Equations**
	Course Code	**: KM184721**
	Credit	**: 2**
	Semester	**: 7**

Description of Course	
In this course we will study the methods of solving numerical equations in either single step or multistep. In addition, a numerical solution of the differential equation system will also be provided. The topics related to this course are the completion of numerical differential equations with the Euler, Heun, Runge Kutta, Milne and Adam-Moulton Methods.	
Learning Outcome	
PLO 3	[C4] Students are able to analyze simple and practical problems in at least one field of analysis, algebra, modeling, system optimizations and computing sciences
PLO 4	[C5] Students are able to work on a simple and clearly defined scientific task and explain the results, both written and verbally either on the area of pure mathematics or applied mathematics or computing sciences
Course Learning Outcome	
1. Students are able to follow the development and apply Mathematics and able to communicate actively and correctly, either oral or written 2. Students are able to explain the basic principles of the theory they understand, especially in relation to the completeness of real numbers, convergence, limits and kekontiuan a function 3. Students are able to explain about the significant role of Real Analysis I in related field clusters or other fields	

4. Students are able to present an understanding of Real Analysis I independently or in teamwork
Main Subject
In this course students will study the following subjects: Definitions of Differential Equations, Taylor Methods, Euler Methods, Heun Methods, Runge Kutta Methods, Multistep Methods, Milne Methods, Adams Methods - Moultons, Differential Equations Systems, Different Definitions Hence, Laplace and Poisson Differential Equations, Problems of non-linear boundary values.
Prerequisites
Ordinary Differential Equations Numerical Method
Reference
1. Gerald, C. F. & Wheatley O. P, 2013. " Applied Numerical Analysis 7th edition", Addison Wesley Publishing Company, California. 2. Burden, R.C., Faires J.D. , Reynolds, A.C., 2010, " Numerical Analysis", Brooks/Cole Cengage Learning, Boston.
Supporting Reference
1. Smith, GD, 1986, "Numerical Solution of Partial Differential Equations: Finite Difference Methods", Oxford University Press, New York 2. Soehardjo, " Refreshing Mathematics ", 1997, ITS, Surabaya