

Department of Mathematics
 Institut Teknologi Sepuluh Nopember
 email : matematika@its.ac.id – web : <https://www.its.ac.id/matematika>

Course	Course Name : Numerical Partial Differential Equations
	Course Code : KM184825
	Credit : 2
	Semester : 8

Description of Course	
<p>In this course we will study the methods of solving partial differential equations numerically, either single step or multistep. In addition will also be given a representation of the difference up. The topics related to this course are the completion of partial, elliptical and hyperbolic partial differential equations. Completion of the Elliptical PDP by using the Laplace equation. The completion of the Parabolic PDP uses an explicit scheme and an implicit scheme. The completion of the Hiperbolic PDP uses different schemes and characteristic methods.</p>	
Learning Outcome	
PLO 2	[C3] Students are able to solve simple and practical problems by applying basic mathematical statements, methods and computations
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	
<ol style="list-style-type: none"> 1. Students are able to follow the development and apply math and able to communicate actively and correctly, either oral or written. 	

<ol style="list-style-type: none"> 2. Students are able to explain the basic principles of Partial Differential Equations consisting of Parabolic PDP, Elliptical PDP and Hiperbolic PDP. 3. Students are able to understand the settlement of PDP by using numerical with several methods.
Main Subject
<p>In this course students will study the following subjects: Definitions of Partial Differential Equations, Parabolic PDP and solutions (explicit and implicit schemes), Eliptic PDPs with their solutions (ADI and SOR schemes) and Hiperbolic PDPs with completion (finite different schemes and characteristic methods).</p>
Prerequisites
<p>Partial Differential Equations Numerical Differential Equations Numerical Method</p>
Reference
<ol style="list-style-type: none"> 1. Steven C. Chapra&Raymond P. Canale, 2010. "Numerical Methods for Engineers 6th edition", McGraw-Hill, Higher Education, Boston, USA. 2. Burden, R.C., Faires J.D. , Reynolds, A.C., 2011, " Numerical Analysis, 9th edition", Brooks/Cole Cengage Learning, Boston.
Supporting Reference
<ol style="list-style-type: none"> 1. Volker John, 2013, "Numerical Methods for Partial Differential Equations", Press, New York 2. Soehardjo, " Refreshing Mathematics ", 1997, ITS, Surabaya