

Department of Mathematics
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Course	Course Name : Matthematical System Modeling
	Course Code : KM184731*
	Credit : 3
	Semester : 7

Description of course	
In this course, students will learn to identify system problems, form mathematical models based on applicable physical laws and study their dynamic behavior both analytically and simulated.	
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 5	[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. Being able to identify natural phenomena and technical problems in the form of dynamic systems 2. Being able to explain the components to form a mathematical model of the system. 3. Beung able to make mathematical models in the form of a system based on applicable physical laws. 	

4. Being able to analyze system dynamics, especially the controllability, observability and stability and also be able to arrange system controllers.

Main subject

1. The basic concept of modeling is based on the laws of physics: problems of heat conduction, string vibration, population growth, transportation; formation of a state space system;
2. System analysis: controllability, observability, stability; establishment of system controllers; the transfer function and the realization of the transfer function in the state space

Prerequisites

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Reference

1. Bellomo.N, Angelis, E.D, and Delitala.M, 2007,," Lecture Note on Mathematical Modelling in Applied Sciences" Department of Mathematics Politecnico Torino Corso DucaDegli Abruzzi 24. 10129 Torino, Italy.
2. Widodo, B., Pemodelan Matematika, ITS Press, 2012.
3. Ogata K, "*Modern Control Engineering*", Fifth Edition, 2010.
4. Subiono, "Sistem Linear dan Kontrol Optimal", versi 2.2.1, 2016.

Supporting references