UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS EDUCATION
Jalan Colombo Nomor 1 Yogyakarta 55281
Telepon(0274)565411 Pesawat 217, (0274)565411(TU),fax (0274)548203
Laman :fmipa.uny.ac.id, E-mail :humas_fmipa@uny.ac.id

Module name:	Introduction to Dynamical Systems
Module level,ifapplicable:	Undergraduate
Code:	MAT6351
Sub-heading,ifapplicable:	-
Classes,ifapplicable:	-
Semester:	6th
Module coordinator:	Kus Prihantoso Krisnawan, M.Si.
Lecturer(s):	1. Dr. Hartono; 2. Kus Prihantoso K., M.Si.
Language:	Bahasa Indonesia
Classification within the curriculum:	Objective course
Teaching format / class hoursperweekduring the semester:	150 minutes lectures and 180 minutes structured activities per week.
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes self-study per week for 16 weeks.
Creditpoints:	3
Prerequisites course(s):	Differential Equations (MAT6214)
Courseoutcomes:	After taking this course the students have ability to: CO 1. Respecting other people's views, opinions,and original ideas CO 2. Understanding definitions, theorems, some forms of phase portraits, and nature of the solution of dynamical

<table>
<tr><td></td><td>systems using critical and systematic thinking in a manner individually or groups
CO 3. Communicating, in writing or verbally,ideas to understand or solve mathematical problems.
CO 4. Explainingthe meaning of the phase portraits and the nature of solution to figure out the characteristics of dynamical system critical points.
CO 5. Making an appropriate dynamical system models and a computer simulation of dynamical system solutions.</td></tr>
<tr><td>Content:</td><td>This course containsdefinitions and theorems as the foundations of mathematics dynamical systems, methods to get solutions of linear systems, and methods to see the nature of solutions. As the foundations, the discussed theories are the definition of dynamical system, diagonalization, eigen values, and eigen vectors. Meanwhile, the methods of getting solutions for linear systems which have real numbers but different eigen values, complex eigen values, and the same eigen values. And finally, the nature of the solutions will be explained by linearization, Lyapunov method, center manifold theorem, normal form, and some methods to see if the solutions have periodic orbits or undergo bifurcations.</td></tr>
<tr><td>Study/exam achievements:</td><td>CO1: Attitude assessment is carried out at each meeting using observation and / or self-assessment techniques by the assumption that every student is good. The student will be given a value as very good or not good if he/she shows, significantly,excellent or poor attitude. The results of attitude assessment used as one of the graduation requirements.

The final grades will be weight as follow:

<table>
<tr><th>No</th><th>CO</th><th>Objek Penilaian</th><th>Teknik Penilaian</th><th>Bobot</th></tr>
<tr><td>1</td><td>CO 2,and 4</td><td>a. Presentation
b. Individual Assignment
c. Quiz</td><td>Observation
Written

Written</td><td>10%
10%

20%</td></tr>
<tr><td>2</td><td>CO 3 and5</td><td>a. Group</td><td>Written</td><td>10%</td></tr>
</table>
</td></tr>
</table>

			Assignment b. Mid test c. Final test		 20% 30%
				Total	100%
Forms of media:	Board, LCD Projector, Laptop/Computer				
Literature:	1. Perko, L. 2000. *Differential Equations and Dynamical Systems*. New York: Springer-Verlag. 2. Kuznetsov, Y.A. 1998. *Elements of applied bifurcation theory*. Second Edition. New York: Springer-Verlag. 3. Wiggins, S. 1990. *Introduction to applied nonlinear dynamical systems and chaos*. New York: Springer-Verlag. 4. Verhulst, F. 1990. *Nonlinear differential equations and dynamical systems.*New York: Springer Science.				

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1		✓								
CO2			✓							
CO3				✓						
CO4					✓					
CO5							✓			
CO6										