Module Description of Ordinary Differential Equations

Module Name	:	Ordinary Differential Equations
Module Level	:	Bachelor
Code, if applicable	:	23H01120603
Subtitle, if applicable	:	-
Courses, if applicable	:	Ordinary Differential Equations
Semester(s) in which the module is taught	:	3 (Third Semester)
Module coordinator(s)	:	Prof. Dr. Jeffry Kusuma
Lecturer(s)	:	Prof. Dr. Jeffry Kusuma
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Compulsory course in second year for Bachelor degree in Mathematics
Type of teaching/teaching method	:	Lecturing, Small Group Discussion, Cooperative Learning, Self-Directed Learning
Contact hours	:	150 minutes lectures per week, 180 minutes structured activities per week, and 180 minutes independent study per week
Workload	:	Total workload is 135 hours per semester which consists of 40 hours per semester for Learning and Teaching, 47.5 hours per semester for Self-Study, and 47.5 hours per semester for Structured Works
Credit points	:	3 (4.8 ECTS)
Requirements according to the examination regulations	:	Students are required to attend at least 80% of the total meetings which is recorded via the attendance menu at https://sikola-v2.unhas.ac.id/, complete all mandatory assignments, and obtain permission from the lecturer to participate in the written examination.
Recommended prerequisites	:	Students have completed and taken the exams for Basic Mathematics I and Basic Mathematics II
Module objectives/intended learning outcomes	:	After the completion of this module, the student will be able to: CLO 1. Students are able to classify and solve ordinary differential equations; CLO 2. Students are able to identify techniques and methods and make connections to solve ordinary differential equation problems; CLO 5. Students are able to communicate mathematical ideas in an appropriate context both orally and in writing with the group; CLO 6. Students are able to apply mathematical method concepts in solving differential equations through the use of appropriate technology.

<table>
<tr><td></td><td></td><td>The following is the mapping of the ILO and the CLO of this course:
<table>
<tr><th></th><th>ILO 1</th><th>ILO 2</th><th>ILO 5</th><th>ILO 6</th></tr>
<tr><td>CLO 1</td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>CLO 2</td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>CLO 3</td><td>X</td><td>X</td><td>X</td><td></td></tr>
<tr><td>CLO 4</td><td>X</td><td></td><td></td><td>X</td></tr>
<tr><td>CLO 5</td><td></td><td>X</td><td>X</td><td></td></tr>
</table></td></tr>
<tr><td>Content</td><td>:</td><td>Differential Equations is a compulsory course that provides an understanding and development of skills in solving continuous mathematical models in the form of ordinary differential equations, which are easily found and applied in various fields of applied mathematics. This course gives students the opportunity to practice recognizing and solving a given ordinary differential equation or system of differential equations. The learning materials for this course include the identification and solution of first-order differential equations with variable coefficients, second-order differential equations, higher-order differential equations, and systems of differential equations. Several methods for solving differential equations will also be discussed, including the series method, Laplace transform, a method using infinite series, and numerical methods that can be used to solve initial value and boundary value problems of various types.</td></tr>
<tr><td>Study and examination requirements</td><td>:</td><td>Study and examination requirements:
● Students must attend 15 minutes before the class starts.
● Students must switch off all electronic devices.
● Students must inform the lecturer if they will not attend the class due to sickness, etc.
● Students must submit all class assignments before the deadline.
● Students must attend the exam to get final grade.</td></tr>
<tr><td>Exams and assessment formats</td><td>:</td><td>Participants are marked based on their performance in theory: Assignments (15%), Written Exam (30%), Quizzes (5%), and Report (50%).

Assignments assess student's ability to apply concepts independently, while Reports measure analytical and writing skills. Quizzes are used to test continuous understanding of weekly content. The Written Exam assesses comprehension and synthesis of all materials discussed during the semester. Altogether, these components account for 100% of the final grade.</td></tr>
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<tr><td></td><td></td><td>Students are marked based on their percentage of points obtained and based on the following grade scale:
<table>
<tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr>
<tr><td>85 – 100</td><td>A</td><td>4.00</td></tr>
<tr><td>80 - <85</td><td>A-</td><td>3.75</td></tr>
<tr><td>75 - < 80</td><td>B+</td><td>3.5</td></tr>
<tr><td>70 - < 75</td><td>B</td><td>3.0</td></tr>
<tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr>
<tr><td>60 - < 65</td><td>C+</td><td>2.5</td></tr>
<tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr>
<tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr>
<tr><td>< 40</td><td>E</td><td>0.00</td></tr>
</table></td></tr>
<tr><td>Reading list</td><td>:</td><td>1. Jeffry Kusuma, Persamaan Differensial Elementer, Diktat Kuliah, Unhas
2. Boyce dan Di Prima, 1992, Elementary Differential Equations and Boundary Value Problems
3. Michael D. Greenberg, 1998, Advanced Engineering Mathematics, 2nd Ed
4. Kreyzig, Erwin, Advanced Engineering Mathematics
5. https://bookboon.com/en/statistics-and-mathematics-ebooks</td></tr>
<tr><td>Last revision date</td><td>:</td><td>July 28th, 2025</td></tr>
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