

**UNDERGRADUATE PROGRAM IN COMPUTER SCIENCE  
DEPARTMENT OF COMPUTER ENGINEERING  
FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY**

Module name	<b>Differential Equations and Series for Engineering</b>	
Module level	Undergraduate	
Code	EC184402	
Courses (if applicable)	Differential Equations and Series for Engineering	
Semester	4 / Spring (Genap)	
Contact person	Susi Juniastuti, S.T, M.Eng.	
Lecturer	Susi Juniastuti, S.T, M.Eng.	
Language	Indonesia / English	
Relation to curriculum	Undergraduate degree program, mandatory, 4 <sup>th</sup> semester.	
Type of teaching, contact hours	Lecture, < 60 students, 170 Minutes * 3 SKS	
Workload	<ol style="list-style-type: none"> <li>1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week.</li> <li>2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week.</li> <li>3. Private study: 3 x 60 = 180 minutes (3 hours) per week.</li> </ol>	
Credit points	3 credit points (sks).	
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.	
Mandatory prerequisites		
Learning outcomes and their corresponding PLOs	<p>CLO-1 Students are able to explain the basic concepts of differential equations.</p> <p>CLO-2 Students are able to explain and apply the concept of solving first-order differential equations using variable separation method, exact differential equation model, and linear differential equation model (Bernoulli Equation).</p> <p>CLO-3 Students are able to analyze the existence and uniqueness of solutions on first order differential equations.</p> <p>CLO-4 Students are able to explain and apply the concept of solving homogeneous two-order differential equations using constant coefficients, and their application to engineering.</p> <p>CLO-5 Students are able to explain and apply the concept of solving non-homogeneous second-order differential equations using undetermined</p>	<p>PLO-3</p> <p>PLO-3 PLO-5</p> <p>PLO-3</p> <p>PLO-5</p> <p>PLO-5 PLO-6</p>

	<p>coefficient method, parameter variation method, and its application in engineering field.</p> <p>CLO-6 Students are able to explain and apply the concept of solving differential equation systems.</p> <p>CLO-7 Students are able to explain and apply the series concept for solving differential equations.</p>	<p>PLO-5 PLO-6</p> <p>PLO-5 PLO-6</p>
Content	<p>In this course, students will learn about solving differential equations using certain methods and using series. Topics include 1st order regular differential equations, 2nd order regular differential equations, differential equation system, solving differential equations using series, high-order differential equations, and application of differential equations in engineering.</p>	
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> <li>• In-class exercises</li> <li>• Quiz 1 and 2</li> <li>• Assignment 1, 2, 3</li> <li>• Mid-term examination</li> <li>• Final examination</li> </ul>	
Media employed	<p>LCD, whiteboard, websites (myITS Classroom).</p>	
Assessments and Evaluation	<p>CO-1: Question no 1 in midterm exam (10%)  CO-2: Question no 2 in midterm exam (10%)  CO-3: Question no 3 in midterm exam (10%), quiz 1 (5%)  CO-4: Assignment 1 (5%), question no 4 in midterm exam (10%), Quiz 2 (5%)  CO-5: Question no 1 in final exam (10%), question no 2 in final exam (10%)  CO-6: Assignment 2 (5%), question no 3 in final exam (10%)  CO-7: Assignment 3 (5%), question no 4 in final exam (5%)</p>	
Reading List	<ol style="list-style-type: none"> <li>1. Kreyszig, Erwin. "Advanced Engineering Mathematics, 9th Edition", John Wiley &amp; Sons, Inc, 2006.</li> <li>2. Robinson, James C, "An Introduction to Ordinary Differential Equation", Cambridge University Press, 2004.</li> <li>3. Jeffrey, Alan. "Advanced Engineering Mathematics", Harcourt Academic Press, London, 2002.</li> <li>4. Paul Dawkins. "Differential Equations". Lamar University.</li> </ol>	