Applied Mathematics 1

Basic Course Information

Course Number	02005015	Subject Category	Compulsory(G)
Class Format	Lecture	Credit Type and Number of Credits	1
Department	Computer	Student Category	Year 3
Period of Study	Semester 1	Classes per Week	2
Required Materials	"Mathematics A"by M. Kobayashi, A. Shimizu, Y. Ichikawa, and M. Sekiguchi (primary) and "Elementary Differential Equations and Boundary Value Problems" 11th ed. By W. E. Boyce, R. C. Diprima, and D. B. Meade (optional)		
Instructor	Panitarn Sanmeta	Adisorn Doodee	

Course Objective

When successfully complete this course, students will be able to:
1. understand the meaning of differential equations and construct the differential equations for a given phenomenon
2. solve various 1st-order ordinary differential equations
3. solve various 2nd-order ordinary differential equations

Evaluation(Rubric)

Evaluation(Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Evaluation 1	Students can fully explain the meaning of differential equations and adequately construct the differential equation for a given phenomenon.	Students can partly explain the meaning of differential equations and partly construct the differential equation for a given phenomenon.	Students can't partly explain the meaning of differential equations and partly construct the differential equation for a given phenomenon.
Evaluation 2	Students can solve various complex 1st-order differential equations.	Students can solve various basic 1st-order differential equations.	Students can't solve various basic 1st-order differential equations.
Evaluation 3	Students can solve various complex 2nd-order differential equations.	Students can solve various basic 2nd-order differential equations.	Students can't solve various basic 2nd-order differential equations.

Relationship with Learning Outcomes

G(1) Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.

G(4) Creativity to make a new value with fusing the knowledge from various fields.

Teaching Method

Outline:	Repeat of Lecture - Drill - Presentation
Class Format:	
Please Note :	The class schedule will be changed based on student conditions and more

Course Plan

Semester 1	Contents and Method of Course	Goals	Related MCC
1st Week	Introduction to the 1st-order linear ordinary differential equations	Students can explain what the differential equation is and draw direction/slope field.	1 79
2nd Week	Method for solving 1st-order linear ODEs: Direct Integration	Students can solve the 1st-order ordinarydifferential equation using direct integration method.	1 79
3rd Week	Method for solving 1st-order linear ODEs: Separation of Variables	Students can solve the 1st-order ordinary differential equation using separation of variables method.	1 79
4th Week	Method for solving 1st-order homogeneous linear ODEs	Students can identify and solve homogeneous equations.	1 80
5th Week	Method for solving 1st-order nonhomogeneous linear ODEs: Variation of Parameters	Students can identify and solve nonhomogeneous linear equations using variation of parameters.	1 80
6th Week	Method for solving 1st-order nonhomogeneous linear ODEs: Integrating Factor	Students can identify and solve nonhomogeneous linear equations using integrating factor.	1 80
7th Week	NO CLASS		
8th Week	Review		1 79 / 1 80
9th Week	Midterm examination	Week 1~8	
10th Week	Introduction ot the 2nd-order ordinary differential equations	Students can understand the characteristics of 2nd-order ordinary differential equations.	1 81
11th Week	Method for solving 2st-order ODEs: Reduction of Order	Students can solve the 2nd-order ordinary differential equations using reduction of order method.	1 81
12th Week	HOLIDAY		
13th Week	Fundamental set of solutions	Students underderstand Fundamental Set of Solutions and the Wronkian	1 81
14th Week	Method for solving 2nd-order homogeneous linear ODEs with constant coefficient: Characteristic Equations	Students can solve the 2nd-order homogeneous linear equations with the constant coefficients.	1 81
15th Week	Method for solving 2nd-order nonhomogeneous ODEs: Undetermined Coefficients	Students can solve the 2nd-order nonhomogeneous linear ODEs with the constant coefficients using the undertermined coefficients method.	1 81
16th Week	Method for solving 2nd-order nonhomogeneous ODEs: Variation of Constants	Students can solve the 2nd-order nonhomogeneous linear ODEs with the constant coefficients using the variation of constants method.	1 81
17th Week	System of 1st-order Linear ODEs	Students can solve the system of 1st-order linear ODEs.	1 80
18th Week	Review		1 80 / 1 81
19th Week	Final Examination	Week 10-18	
20th Week	Return answer-sheets. Review semester and feedback	Summary	

Do not c

	Examination	Class Participation	Drill Submission
Basic Ability	70	15	15
Technical Ability	0	0	0
Interdisciplinary Ability	0	0	0