

Akashi College		Year	2022		Course Title	Applied Mathematics B	
Course Information							
Course Code		4428		Course Category		Specialized / Elective	
Class Format		Lecture		Credits		School Credit: 2	
Department		Electrical and Computer Engineering Computer Engineering Course		Student Grade		4th	
Term		Second Semester		Classes per Week		4	
Textbook and/or Teaching Materials							
Instructor		OGASAWARA Hiromichi					
Course Objectives							
(1) Can make a deductive inference based on basic matters, including reading and writing logical sentences containing mathematical formulae.							
(2) Can perform basic calculations in vector calculus, and apply them to engineering and physics on a basic level.							
Rubric							
		Ideal Level		Standard Level		Unacceptable Level	
Achievement 1		Can accurately make a deductive inference based on basic matters.		Can make a deductive inference based on basic matters.		Cannot make a deductive inference based on basic matters.	
Achievement 2		Can fully perform basic calculations in vector calculus, and fully apply them to engineering and physics on a basic level.		Can perform basic calculations in vector calculus, and apply them to engineering and physics on a basic level.		Cannot perform basic calculations in vector calculus, and apply them to engineering and physics on a basic level.	
Assigned Department Objectives							
Teaching Method							
Outline		In this course, we will learn the basics of vector calculus (including topics on complex functions of one variable) based on the calculus and linear algebra learned so far. This is also applied to engineering and physics, so this class will also cover them, including basic applications.					
Style		Classes will be taught in a lecture style, and there will also be exercises and quizzes.					
Notice		Instead of memorizing theorems and formulae individually, carefully follow the development of discussions and the proof of theorems given in each lecture, so that you can understand it yourself. In problem exercises, do not try to remember the steps to solve a problem, but rather try to solve it yourself based on definitions and basic theorem and ideas. Also, if necessary, review the content learned during the previous years. Students can earn extra points by submitting voluntary assignments, and lose their points depending on their attitude, etc. in the class. Students who miss 1/3 or more of classes will not be eligible for a passing grade.					
Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
2nd Semester	3rd Quarter	1st	Review and supplementary lesson on vector calculations		Can handle the basic matters of vector calculations that's necessary for future learning.		
		2nd	Curves		Can handle curves using parameters.		
		3rd	Curves		Can handle curves using the arc length parameter.		
		4th	Line integrals		Can calculate and discuss based on the basic matters of line integrals.		
		5th	Line integrals Gradient		Can perform calculations and discussions related to Green's theorem. Can calculate and discuss based on the basic matters of the gradient vector.		
		6th	Gradient		Can perform calculations and discussions related to exact differential equations.		
		7th	Conservative forces and potential energy Surfaces and surface integrals		Can handle conservative forces and potential energy based on the methods of vector calculus. Can handle surfaces using parameters.		
		8th	Surfaces and surface integrals Midterm exam		Can perform calculations and discussions related to tangent planes.		
	4th Quarter	9th	Surfaces and surface integrals		Can calculate and discuss based on the basic matters of surface integrals.		
		10th	Derivative of vector fields and integral theorem		Can calculate and discuss based on the basic matters of volume integrals.		
		11th	Derivative of vector fields and integral theorem		Can calculate and discuss based on the basic matters of the divergence of a vector field and Gauss's theorem.		
		12th	Derivative of vector fields and integral theorem Overview of the theory of functions of a complex variable		Can calculate and discuss based on the basic matters of the rotation of a vector field and Stokes's theorem. Can calculate and discuss based on the basic matters of the functions of a complex variable.		

		13th	Overview of the theory of functions of a complex variable	Can calculate and discuss based on the basic matters of complex integrals.
		14th	Overview of the theory of functions of a complex variable	Can calculate and discuss based on the basic matters of singular points.
		15th	Application to electromagnetism	Can handle the basic matters of electromagnetism based on the methods of vector calculus.
		16th	Final exam	

#### Evaluation Method and Weight (%)

	Examination	Exercises / Short test	Total
Subtotal	60	40	100
Basic Proficiency	60	40	100
Specialized Proficiency	0	0	0
Cross Area Proficiency	0	0	0