Akashi College	Year	2022	Course Title	Mathematical Concepts

Course Information

Course Code	4409	Course Category	General / Elective
Class Format	Lecture	Credits	School Credit: 1
Department	Mechanical Engineering	Student Grade	4th
Term	Second Semester	Classes per Week	2
Textbook and/or Teaching Materials	詳解と演習 大学編入試験問題〈数学〉 (LIBRARY工学基礎&高専TEXT 別巻1)		
Instructor	NAGAO Hidehito		

Course Objectives

(1) Understand the basic concept of probability and be able to elucidate uncertain phenomena.
(2) Understand the basic concepts of partial differential and multiple integral, and be able to elucidate phenomena related to multivariable functions.
(3) Understand the basic concepts of differential equations and elucidate phenomena that follow the principles.
(4) Understand the basic concept of linear algebra and apply matrices and vectors to elucidate phenomena.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Understand the basic concept of probability and elucidate uncertain phenomena.	Understand the basic concept of probability.	Do not understand the basic concept of probability.
Achievement 2	Understand the basic concepts of partial differential and multiple integral, and be able to elucidate phenomena related to multivariable functions.	Understand the basic concepts of partial differential and multiple integral.	Do not understand the basic concepts of partial differential and multiple integral.
Achievement 3	Understand the basic concepts of differential equations and elucidate phenomena that follow the principles.	Understand the basic concepts of differential equations.	Do not understand the basic concept of differential equations.
Achievement 4	Understand the basic concepts of linear algebra and apply matrices and vectors to elucidate phenomena.	Understand the basic concept of linear algebra.	Do not understand the basic concept of linear algebra.

Assigned Department Objectives

Teaching Method

Outline	Review and develop learning of technical college mathematics focusing on probability, partial differential, multiple integral, differential equation, and linear algebra.
Style	Lessons by lecture and practice-type, timely assignments, quizzes, etc.
Notice	Absence conditions (ratio) that are not eligible for passing 1/3 or more absenteeism

Characteristics of Class / Division in Learning

☑ Active Learning	☑ Aided by ICT	☑ Applicable to Remote Class	☑ Instructor Professionally Experienced

Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	Probability	Understand and can calculate conditional probabilities and multiplication rules.
		2nd	Probability	Understand and can calculate expected values, variances, and standard deviations.
		3rd	Probability	Understand and can calculate binomial distribution, Poisson distribution, and normal distribution.
		4th	Partial differential and multiple integral	Understand and can calculate partial differentials, tangent plane equations, and differentials of composite functions.
		5th	Partial differential and multiple integral	Understand and can calculate the extremum judgment method and Lagrange's multiplier method.
		6th	Partial differential and multiple integral	Understand and can calculate multiple integrals and iterated integrals.
		7th	Partial differential and multiple integral	Understand and can calculate change of variables and improper integrals.
		8th	Summary	Review / development
	4th Quarter	9th	Differential equation	Understand and can calculate first-order differential equations.
		10th	Differential equation	Understand and can calculate second-order differential equations.
		11th	Differential equation	Understand and can calculate non-linear differential equations
		12th	Linear algebra	Understand and calculate the eigenspace.
		13th	Linear algebra	Understand and calculate the diagonalization of matrices.

		14th	Linear algebra	Understand and calculate vector spaces and linear maps.
		15th	Summary	Review / development
		16th	Exam	

Evaluation Method and Weight (%)

	Exam	Task・ Attitude・Attendance etc	Total
Subtotal	70	30	100
Basic Proficiency	70	30	100
Specialized Proficiency	0	0	0
Cross Area Proficiency	0	0	0