

Akashi College		Year	2022	Course Title	Probability and Statistics
Course Information					
Course Code	4520		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Electrical and Computer Engineering Electrical Engineering Course		Student Grade	5th	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials					
Instructor	HAMADA Yukihiro				
Course Objectives					
[1] Can organize 1- and 2-dimensional data. [2] Understand the concept of probability and can calculate the probability of an event. [3] Understand the concept of probability distribution and can calculate the amount of samples. [4] Understand the concepts of statistics and can calculate basic statistics. [5] Can make statistical estimates. [6] Can perform statistical tests.					
Rubric					
	Ideal Level	Standard Level		Unacceptable Level	
Achievement 1	Can correctly calculate mean, variance, covariance, and correlation coefficient and create a histogram.	Can calculate mean, variance, covariance, and correlation coefficient and create a histogram.		Cannot calculate mean, variance, covariance, and correlation coefficient and create a histogram.	
Achievement 2	Can correctly calculate the probability and conditional probability of an event, and determine the independence of the event correctly.	Can calculate the probability and conditional probability of an event, and determine the independence of the event.		Cannot calculate the probability and conditional probability of an event, and determine the independence of the event.	
Achievement 3	Can correctly calculate the probability of an event under binomial distribution, Poisson distribution, and normal distribution.	Can calculate the probability of an event under binomial distribution, Poisson distribution, and normal distribution.		Cannot calculate the probability of an event under binomial distribution, Poisson distribution, and normal distribution.	
Achievement 4	Understand samples and populations and can correctly calculate sample mean, sample variance, and unbiased variance.	Understand samples and populations and can calculate sample mean, sample variance, and unbiased variance.		Do not understand samples and populations and cannot calculate sample mean, sample variance, and unbiased variance.	
Achievement 5	Can accurately make point estimation and interval estimation.	Can make point estimation and interval estimation.		Cannot make point estimation and interval estimation.	
Achievement 6	Can accurately test the population mean and the population variance.	Can test the population mean and the population variance.		Cannot test the population mean and the population variance.	
Assigned Department Objectives					
Teaching Method					
Outline	The purpose of the probabilities and statistics is to identify the pattern from various coincidence that occurs around us, explain what happened based on the pattern, and estimate the whole from the part. In this course, students will learn the basics of probability theory and statistics.				
Style	Each week, the class will alternate between explanation and exercise about the content you will learn for the week.				
Notice	This course's content will amount to 90 hours of study in total. These hours include the learning time guaranteed in classes and the standard self-study time required for review and completing assignment reports. There will be two assignments, and both of them must be submitted by the due date. One of the assignments involves programming in C. Students should have a prior knowledge of linear algebra and calculus. Try to solve the questions or exercise problems yourself and score it against the answer. Students who miss 1/3 or more of classes will not be eligible for a passing grade.				
Characteristics of Class / Division in Learning					
☐ Active Learning		☒ Aided by ICT		☒ Applicable to Remote Class	
				☐ Instructor Professionally Experienced	
Course Plan					
			Theme	Goals	
1st Semester r	1st Quarter	1st	Course guidance and 1-dimensional data 1/2	Understand the objectives and grading method of the course. Can create a frequency distribution table and a histogram of the data.	
		2nd	1-dimensional data 2 of 2	Can calculate mean, median, mode, variance, and standard deviation of the data.	
		3rd	2-dimensional data	Can calculate the correlation coefficient and regression line of 2-dimensional data.	
		4th	Discrete probability	Can explain the meaning and nature of trials, events, and probability.	
		5th	Conditional probability and probability variables	Can calculate conditional probability. Also, can determine whether two events are independent.	

		6th	Probability variables and distribution	Can explain discrete probability variables and discrete probability distributions. Also, can explain the sequential probability variables and the probability density function.
		7th	Mean and variance of probability variables	Can calculate mean and variance of probability variables.
		8th	Midterm examination It is given during class.	
	2nd Quarter	9th	Binomial distribution and Poisson distribution	Can explain the binomial distribution and Poisson distribution and can calculate their means and distributions.
		10th	Normal distribution	Can explain and use normal distribution. Also, can explain the relationship between binomial distribution and normal distribution.
		11th	Sample distribution	Can explain population, sample, sample mean, sample variance, unbiased-variance, the law of large numbers, and central limit theorem.
		12th	Central limit theorem	Can explain normal population and central limit theorem.
		13th	Various probability distributions	Can explain the chi-squared distribution and t-distribution.
		14th	Estimation and test 1 of 2	Can perform interval estimation of population mean when the population variance is known and unknown. Also, can explain what we claim by statistical tests.
		15th	Test 2 of 2	Can perform two-tailed and one-tailed tests for the population mean when the population variance is known and unknown.
		16th	Final examination	

Evaluation Method and Weight (%)

	Examination	Task	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	80	20	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	80	20	0	0	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0