Tsuyama College	Year	2020	Course Title	Applied Mathematics I

Course Information

Course Code	0092	Course Category	General / Compulsory
Class Format	Lecture	Credits	School Credit: 2
Department	Department of Integrated Science and Technology Advanced Science Program	Student Grade	4th
Term	Year-round	Classes per Week	2
Textbook and/or Teaching Materials			
Instructor	MATSUDA Osamu		

Course Objectives

Purpose of learning: To understand the meaning of statistics be able to estimate and test from actual statistical data.

Attainment target
1. You can find various probabilities and understand the probability of complementary events, the addition theorem of probability, and the probability of mutual exclusivity.
2. To be able to find conditional probabilities and understand the multiplication theorem of probabilities and the probabilities of independent events.
3. To understand 1D and 2D data to obtain mean, variance, standard deviation, correlation coefficient, and regression line.
4. To understand the basic sample distribution and be able to calculate probabilities using it.
5. To learn how to estimate and test the population parameter.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Clearly understand the probability of complementary events, the addition theorem of probability, and the probability of mutual exclusivity, and solve basic problems.	Can solve about 60% of the basic problems of probability of complementary events, the addition theorem of probability, and the probability of mutual exclusivity.	Cannot solve about 60% of the basic problems of the probability of complementary events, the addition theorem of probability, and the probability of mutual exclusivity.
Achievement 2	Understand conditional probabilities, multiplication rules of probabilities, and probabilities of independent events, and be able to solve basic problems.	Can solve about 60% of the basic problems of conditional probability, multiplication rule of probability, and probability of independent events.	Cannot solve about 60% of the basic problems of conditional probability, multiplication rule of probability, and probability of independent event.
Achievement 3	Clearly understand the meanings of mean, variance, standard deviation, correlation coefficient, regression line, etc. for 1D and 2D data and can calculate them.	Understand and can calculate the mean, variance, standard deviation, correlation coefficient, regression line, etc. of 1D and 2D data.	Doesn't understand the mean, variance, standard deviation, correlation coefficient, regression line, etc. of 1D and 2D data.
Achievement 4	Clearly understand the meaning of the basic sample distribution and can calculate probability using it.	Can calculate using a basic sample distribution and work about 60% of problems.	Cannot calculate using a basic sample distribution and cannot work about 60% of problems.
Achievement 5	Clearly understand the method of estimating the population parameter and the method of the test, and can solve the standard problems related to them.	Can solve about 60% of the standard problems related to the method of estimating the population parameter.	Cannot solve about 60% of the standard problems related to the method of estimating the population parameter.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : Specialized Field of learning : Natural science Common / Basic Required, Elective: Elective must complete subjects Foundational academic disciplines : Mathematical science / Mathematics / Analysis basics Relationship with Educational Objectives : This subject corresponds to the learning goal "(2) Acquire basic science and technical knowledge". Relationship with JABEE programs : The main goal of learning / education in this class are "(A) , A-1". Class Outline: In Applied Mathematics I, you will learn the basics of probability theory and statistics. In probability theory, we look at the theory of distributions (binomial distribution, Poisson distribution, normal distribution) and the central limit theorem, which are important in statistical processing. Learn the equations of correlation and regression line as an arrangement of two-variable data. Finally, learn how to estimate and test the population.
Style	Course method : Focus on understanding the content on the board, and assign as many exercises as possible to deepen understanding. Grade evaluation method : 4 regular exams (50%) and other exams, exercises, reports and effort of class(50%). etc, A re-examination may be conducted. The retest will be evaluated in the same way as the main test, with an upper limit of 80 points. Textbooks, notebooks, etc. are not allowed for the exam.

Notice	Precautions on enrollment : Students must take this class (no more than one-third of the required number of class hours missed) in order to complete the academic year. Course advice: This course teaches the basic ideas of probability and statistical methods required for engineering, so this course is of great importance. Foundational subjects : Fundamental Mathematics (1st year), Fundamental Linear Algebra (2nd), Differential and Integral Ⅰ(2nd), Differential and Integral Ⅱ (3rd) Related subjects: Mathematics, physics, and other subjects after the third year Attendance advice : If you are late after, you may be treated as absent after a warning.

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance Definition and nature of probability 1	Understanding the basic formula of probability
		2nd	Definition and property of probability 2	Understanding iterative trials
		3rd	Various probabilities	Understanding conditional probabilities
		4th	Various probabilities 2	Understanding Bayes' theorem
		5th	Random variables and probability distribution 1	Understanding Random Variables and Probability Distributions
		6th	Random variables and probability distribution 2	Understanding the binomial distribution and Poisson distribution
		7th	Probability and random variable exercises	
		8th	First term midterm exam	
	2nd Quarter	9th	Return and explanation of answers, random variables and probability distribution 3	Understanding the normal distribution
		10th	Random variables and probability distribution 4	Understanding the binomial and normal distributions
		11th	One-dimensional data 1	Understanding frequency distribution table and representative values
		12th	One-dimensional data 2	Understanding variance and standard deviation
		13th	2 variable data 1	Understanding correlation
		14th	2 variable data 2	Understanding regression lines
		15th	Last term exam	
		16th	Return of answer, commentary, supplementary explanation	
2nd Semester	3rd Quarter	1st	Statistic and sampling distribution 1	Understanding Statistics and Sampling Distribution
		2nd	Statistic and sampling distribution 2	Understanding various probability distributions
		3rd	Statistic and sampling distribution 3	Confirmation of goals
		4th	Statistical inference 1	Point test / interval estimation of population mean
		5th	Statistical inference 2	Interval estimation of population ratio
		6th	Statistical inference 3	Interval estimation of population variance
		7th	Statistical inference exercises	
		8th	Late midterm exam	
	4th Quarter	9th	Return of answer, commentary, supplementary explanation	
		10th	Hypothesis test 1	Hypothesis and test, test of population mean
		11th	Hypothesis test 2	Population mean test
		12th	Hypothesis test 3	Test of population ratio
		13th	Hypothesis test 4	Test of population variance
		14th	Hypothesis testing exercises	
		15th	Year-end exam	
		16th	答案の返却と解説，補足説明	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	0	0	0	0	50	100
Basic Proficiency	50	0	0	0	0	50	100
Specialized Proficiency	0	0	0	0	0	0	0

Cross Area Proficiency	0	0	0	0	0	0	0