

Tsuyama College		Year	2021	Course Title	Fundamental Mathematics Practice
Course Information					
Course Code	0017		Course Category	General / Compulsory	
Class Format	Lecture		Credits	School Credit: 2	
Department	Department of Integrated Science and Technology Advanced Science Program		Student Grade	1st	
Term	Year-round		Classes per Week	2	
Textbook and/or Teaching Materials					
Instructor	MATSUDA Osamu,NOMURA Kensaku,KUBO Toshihiro,MINATOHARA Tetsuya				
Course Objectives					
Purpose of study: To review mathematics learned through junior high school, further develop them, and acquire the basic mathematics knowledge needed for specialized subjects to be learned in the future.					
Attainment target: 1. To aibe to solve problems including factorization, addition / subtraction / multiplication / division of fractional formulas, square roots / complex numbers. 2. To aibe to solve problems related to equations, inequalities, quadratic functions, etc. 3. To aibe to solve problems related to fractions, exponentials, logarithmic functions, etc. 4. To understand and calculate elementary functions such as trigonometric functions.					
Rubric					
	Ideal Level	Standard Level		Unacceptable Level	
Achievement 1	Can solve applied problems including factorization, addition / subtraction / multiplication / division of fractional formulas, square roots / complex numbers.	Can solve standard problems including factorization, addition / subtraction / multiplication / division of fractional formulas, square roots / complex numbers.		Cannot solve basic problems including factorization, addition / subtraction / multiplication / division of fractional formulas, square roots / complex numbers.	
Achievement 2	Understand and can apply permutations, combinations, and binomial theorems.	Understands permutations, combinations, and binomial theorems, and is able to solve standard problems.		Doesn't understand permutations, combinations, and binomial theorems.	
Achievement 3	Can solve applied problems related to fractions, exponentials, logarithmic functions, etc.	Can solve standard problems related to fractions, exponentials, logarithmic functions, etc.		Cannot solve basic problems related to fractions, exponentials, logarithmic functions, etc.	
Achievement 4	Can solve applied problems related to trigonometric functions.	Understands elementary functions such as trigonometric functions and is able to perform standard calculations.		Cannot do basic calculations of elementary functions such as trigonometric functions.	
Assigned Department Objectives					
Teaching Method					
Outline	General or Specialized :: General Learning field: Natural science basics Required, Elective: Elective must complete subjects Foundational academic disciplines: Mathematical science / mathematics / foundations of mathematics Relationship with Educational Objectives: This subject is equivalent to "② Acquire basic science and thecnical knowledge". Relationship with JABEE programs: The main goal of learning / education in this subject is "(A) . Course outline: This subject is the basis for studying specialized subjects based on mathematics learned in the second grade and beyond. Factorization, equations and inequality, permutations and combinations, sequences, exponential / logarithmic functions, trigonometric functions, etc. Practice elementary functions.				
Style	Course method: In the first semester, lectures will be given on the contents of Chapters 1 and 7, and exercises will be conducted leading to an exercise report. In the second semester, we will explain the basics of Chapters 4 and 5, perform exercises, and assign an exercise report. Grade evaluation method: Exercise reports (50%) and 4 regular exams (50%).				
Notice	Precautions on enrollment: It is necessary to take this course in order to complete the course for the academic year. Course advice: Students should solve not only the problems from class but also problems from textbooks used in basic mathematics. Foundational subjects: Mathematics learned through junior high school Related subjects: Fundamental Mathematics (1 year) Attendance advice: If you are late after, you may be treated as absent after a warning.				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced		
Course Plan					

			Theme	Goals
1st Semester	1st Quarter	1st	• Guidance, calculation of numbers and formulas (including review of junior high school. Lectures and exercises)	p1-p4 Addition / subtraction of rectification, product and quotient of monomial
		2nd	• Calculation of numbers and formulas (including addition / subtraction / product of formulas, review of junior high school. Lectures and exercises)	p5-p10 Formal product, basic expansion formula, evolutionary expansion formula
		3rd	• Calculation of numbers and formulas (expansion of formulas, factorization. Lectures and exercises)	p11-p16 Factorization (common factorization), quadratic factorization, factorization (tasukigake)
		4th	• Calculation of numbers and formulas (factorization. Lectures and exercises.)	p17-p22 Factorization (3rd order), division of formulas, greatest common divisor / least common multiple
		5th	• Calculation of numbers and formulas (greatest common divisor, addition / subtraction / multiplication / division of fractional formulas. Lectures and exercises)	p23-p28 Subdivision / multiplication / division of fractional formulas, addition / division of fractional formulas, fractional formulas
		6th	• Calculation of numbers and formulas (calculation including square root, rationalization of denominator. Lectures and exercises)	p29-p34 Calculation including square root, rationalization of denominator, absolute value
		7th	• Calculation of numbers and formulas (complex numbers, realization of denominators. Lectures and exercises)	p35-p38 Complex numbers, realization of denominator
		8th	(First term midterm exam)	60% or more of basic content up to p34
	2nd Quarter	9th	• Return of the first half of the exam, explanation of answers, number of cases	Correct the wrong answer. Textbook p194-p196 Number of cases
		10th	• Permutation, combination	Textbook p196-p199 Permutation
		11th	• Various permutations and binomial theorems	Textbook p200-p202 combination
		12th	• Sequence, arithmetic progression, geometric progression	Textbooks p202-p206 Various permutations, two-law theorems
		13th	• Sum of various sequences	Textbook p211-p214 Sum of arithmetic progression and sum of geometric progression
		14th	• Recurrence formula and mathematical induction	Textbook p215-p216 Sum of various sequences Textbook p218 Recurrence formula
		15th	(Last term exam)	Understanding the number of cases
		16th	• Return of the final exam, explanation of answers, mathematical induction	p218-p220 Mathematical induction
2nd Semester	3rd Quarter	1st	• Review of exponential function 1 (exercise)	p119-p122 Power root, exponential law
		2nd	• Review of exponential function 2 (exercise)	p123-p126 Exponential function and its graph, exponential equations and inequalities
		3rd	• Review of logarithmic function 1 (exercise)	p127-p130 Logarithmic nature, base conversion formula
		4th	• Review of logarithmic functions 2 (exercise)	p131-p134 Logarithmic function graphs, logarithmic equations and inequalities
		5th	• Review of logarithmic functions 3 (exercise)	p135-p138 Common logarithm, acute angle triangle ratio
		6th	• Review of triangle ratio 1 (exercise)	p139-p142 Calculation of trigonometric ratio, cosine theorem
		7th	• Review of triangle ratio 2 (exercise)	p143-p146 Law of sines, area of triangle
		8th	(Late midterm exam)	Exponential. Understanding the trigonometric ratio
	4th Quarter	9th	• Review of triangle ratio 3 (exercise)	p147-p150 General angle and radian method, fan-shaped arc length and area
		10th	• Review of triangle ratio 4 (exercise)	p151-p154 General angle trigonometric function, interrelationship of trigonometric functions
		11th	• Review of trigonometric functions 1 (exercise)	p155-p158 Trigonometric function properties, sine function graph
		12th	• Review of trigonometric functions 2 (exercise)	p159-p162 Cosine function graph, tangent function graph
		13th	• Review of trigonometric functions 3 (exercise)	p163-p166 Trigonometric graph properties, trigonometric addition theorem
		14th	• Review of trigonometric functions 4 (exercise)	p167- p172 Double-byte / half-width formula, trigonometric function composition (Note. Excluding p169-p170)
		15th	(Late term exam)	Understanding trigonometric functions

		16th	• Return of the final exam, explanation of answers, review of trigonometric functions 5 (practice)	p173-p174 Triangular equations and inequalities			
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