Tsuyama College	Year	2020		Course Title	Fundamental Mathematics

Course Information

Course Code	0016		Course Category	General / Compulsory
Class Format	Lecture		Credits	School Credit: 4
Department	Department of Integrated Science and Technology Communication and Informations System Program		Student Grade	1st
Term	Year-round		Classes per Week	4
Textbook and/or Teaching Materials	Textbook : "Shin kisosuugaku" (Dainippontosyo)			
Instructor	YOSHIDA Eiji,YOKOTANI Masaaki,YAMANAKA Satoshi,MIYAZAKI Hayato			

Course Objectives

Learning purpose :
The purpose of this course is to further develop the mathematics learned up to junior high school, and to acquire the basic knowledge necessary for the mathematics and specialized l subjects to be studied in the future.

Course Objectives :
1. To understand the basics of quadratic equations and quadratic functions.
2. To understand elementary functions such as exponential functions, logarithmic functions, and trigonometric functions and the student can perform basic calculations.
3. To understand the basics of equations for plane figures (lines and quadratic curves).

Rubric

	Exellent	Good	Acceptable	Not acceptable
Achievement 1	The student can solve applied problems related to quadratic equations and quadratic functions.	The student can understand and calculate standard problems of quadratic equations and quadratic functions.	The student can understand the basics of quadratic equations and quadratic functions, and can calculate basic problems.	The student can not calculate standard problems of quadratic equations and quadratic functions.
Achievement 2	The student can solve applied problems related to exponential / logarithmic functions and trigonometric functions.	The student can understand and calculate standard functions such as exponential / logarithmic functions and trigonometric functions.	The student can understand basic functions such as exponential / logarithmic functions and trigonometric functions, and can perform basic calculations.	The student can not understand elementary functions such as exponential functions, logarithmic functions, and trigonometric functions, and cannot perform basic calculations.
Achievement 3	The student can understand the equations of plane figures such as straight lines and quadratic curves, and can solve applied problems.	The student can understand the equations of plane figures such as straight lines and quadratic curves, and can solve standard problems.	The student can understand the equations of plane figures such as straight lines and quadratic curves, and can solve basic problems.	The student can not understand the equations of plane figures such as straight lines and quadratic curves.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : General Field of learning : natural science, common and basics Required, Elective, etc. : Must complete subjects Foundational academic disciplines : Mathematical science / mathematics / foundamental of mathematics Relationship with Educational Objectives : This class is equivalent to "(2) Acquire basic science and technical knowledge". Relationship with JABEE programs : The main goal of learning / education in this class is "(A)". Course outline : This class is the basis for studying mathematics and specialized subjects learned in the second grade and beyond. Learn how to solve quadratic equations and quadratic inequalities, basic properties of elementary functions (quadratic functions, exponential functions, logarithmic functions, trigonometric functions, etc.), and the relationship between graphs and equations / inequalities.
Style	Course method : Basically, the student takes lectures, but also does exercises to deepen their understanding. Grade evaluation method : Exams [50%] + Others (exercises, submissions, etc.)[50%]. Regular examinations will be conducted a total of 4 times, and the evaluation ratios will be the same. Depending on the grade, the student may be required to retake the exam or submit additional report

			Theme	Goals

<table>
<tr><td>Notice</td><td colspan="4">Precautions on the enrollment :
It is necessary to take this course in order to complete the course of the academic year.

Course advice :
Students will proceed with the lessons while reviewing as necessary, but let's review the mathematics studied in junior high school.

Foundational subjects :
Mathematics studied in junior high school.

Related subjects :
Fundamental Mathematics Practice (1st year), Differential and Integral I (2nd year), Fundamental Linear Algebra (2nd year)

Attendance advice :
Do preparation and review. If you have any questions, ask questions during class, or ask your teacher or friends after school. Solve many problems in textbooks and workbooks to deepen your understanding. If you are late a lot, you may be treated as absent after giving a warning.</td></tr>
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Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, Equation 1 (Textbook p34-49)	Students can understand the relationship between the solution of a quadratic equation and the discriminant, and the relationship between the solution and the coefficient, and can solve problems related to these.
		2nd	Equation 2	Students can solve various equations such as higher-order equations and simultaneous equations.
		3rd	Equation 3	Students can understand identities and can prove various equations.
		4th	Inequality 1 (Textbook p50-70)	Students can understand the property of inequalities and be able to solve various inequalities such as linear inequalities and simultaneous inequalities.
		5th	Inequality 2	Students can prove various inequalities by using the property of inequalities and the arithgometric and geometric mean.
		6th	Inequality 3	Students can understand the basic facts about sets and propositions, and can solve problems related to them.
		7th	Exercise	Confirmation of basic matters
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Return and commentary of exam answers, Quadratic function 1 (Textbook p71-86)	Students can find graphs of quadratic functions and parabolic equations.
		10th	Quadratic function 2	Students can find the maximum and minimum values of the quadratic function.
		11th	Quadratic function 3	Students can understand the relationship between the discriminant and the number of shared points, and can solve problems related to these.
		12th	Various function 1 (Textbook p87-100)	Students can understand power functions and fractional functions, and can draw their graphs.
		13th	Various function 2	Students can understand the irrational function and the inverse function, and can draw the graph.
		14th	Exercise	Confirmation of basic matters
		15th	1st semester final exam	
		16th	Return and commentary of exam answers	
2nd Semester	3rd Quarter	1st	Exponential function 1 (Textbook p101-110)	Students can understand the property of power roots and exponents, and can solve problems related to them.
		2nd	Exponential function 2	Students can understand the exponential function and can solve equations and inequalities using the exponential function.
		3rd	Logarithmic function 1 (Textbook p111-120)	Students can understand the property of logarithms and can solve problems related to them.
		4th	Logarithmic function 2	Students can understand logarithmic functions and be able to solve equations and inequalities using logarithmic functions.
		5th	Trigonometric ratio and its application 1 (Textbook p123-136)	Students can find the trigonometric ratio of the acute angle and the obtuse angle.
		6th	Trigonometric ratio and its application 2	Students can understand the sine rule and the cosine rule, and can find the lengths, angles, and areas of various triangles.
		7th	Trigonometric function 1 (Textbook p137-152)	Students can understand the relationship between trigonometric functions of general angles and the radian method, and can obtain the values of various trigonometric functions.
		8th	2nd semester mid-term exam	
	4th Quarter	9th	Return and commentary of exam answers, Trigonometric function 2	Students can draw a graph of trigonometric functions. In addition, can solve equations and inequalities using trigonometric functions.

		10th	Addition theorem and its application 1 (Textbook p.153-163)	Students can find the value of various trigonometric functions using the additive theorem.
		11th	Addition theorem and its application 2	Students can understand formulas that apply addition theorems (double-angle formulas, half-angle formulas, etc.), and can solve problems related to them.
		12th	Point and straight line (Textbook p164-174)	Students can find the distance between two points, the coordinates of the internally dividing point, and the barycentre of the triangle. In addition, can obtain the equation and graphs of various straight lines.
		13th	Quadratic curve 1 (Textbook p175-193)	Students can find equations and graphs of circles, ellipses, hyperbolas, and parabolas.
		14th	Quadratic curv e2	Students can draw the area represented by the inequality.
		15th	2nd semester final exam	
		16th	Return and commentary of exam answers	

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