

Akashi College		Year	2022		Course Title	Mathematics II B
Course Information						
Course Code	4204			Course Category	General / Compulsory	
Class Format	Lecture			Credits	School Credit: 2	
Department	Architecture			Student Grade	2nd	
Term	Year-round			Classes per Week	2	
Textbook and/or Teaching Materials	Linear Algebra					
Instructor	TAKATA Isao,SHIGAKI Takahiro					
Course Objectives						
1. Can compute vectors and apply them to shapes. 2. Understand the definition of matrices, and can perform matrix computations and solve simultaneous linear equations. 3. Understand the definition and properties of determinants, and can calculate the values of basic ones.						
Rubric						
	Ideal Level		Standard Level		Unacceptable Level	
Achievement 1	Can fully compute vectors and apply them to shapes.		Can compute vectors and apply them to shapes.		Cannot compute vectors and apply them to shapes.	
Achievement 2	Fully understand the definition of matrices, and can fully perform matrix computations and solve simultaneous linear equations.		Understand the definition of matrices, and can perform matrix computations and solve simultaneous linear equations.		Do not understand the definition, and cannot perform matrix computations and solve simultaneous linear equations.	
Achievement 3	Fully understand the definition and properties of determinants, and can fully calculate the values of basic ones.		Understand the definition and properties of determinants, and can calculate the values of basic ones.		Do not understand the definition and properties of determinants, and cannot calculate the values of basic ones.	
Assigned Department Objectives						
Teaching Method						
Outline	Classes and exercises will be given on the basics of linear algebra, which is used in a wide range of fields. The goal is to become able to relate computation to geometry by using equations for shapes in a plane or in space					
Style	In the first semester, students will be asked to prepare for the lesson using videos along the syllabus, and to have them study in groups during the lesson. In the second semester, there will be lecture-style classes, tests at appropriate times, and report assignments. Takata is in charge of the first half, and Shigaki (Omeda is the liaison) in the second half.					
Notice	Try to understand the material thoroughly during the classes. Make an effort to always ask about things that are unclear, and solve them then and there. Also, always review the material on the same day, and do the problem exercises properly. Students who miss 1/3 or more of classes will not be eligible for a passing grade.					
Characteristics of Class / Division in Learning						
<input checked="" type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced
Course Plan						
			Theme		Goals	
1st Semester r	1st Quarter	1st	vectors		Can perform basic vector operations.	
		2nd	vectors		Can calculate the inner product of vectors.	
		3rd	vectors		Can represent the components of vectors.	
		4th	vectors		Can represent the components of the space vectors.	
		5th	vectors		Can calculate the area of the parallelogram by using a matrix.	
		6th	vectors		Can understand parallel and vertical conditions.	
		7th	vectors		Can obtain the straight line vector equation.	
		8th	vectors		Can understand and calculate the outer product.	
	2nd Quarter	9th	vectors		Can obtain the equation of a plane.	
		10th	vectors		Can calculate the distance between a point and a plane.	
		11th	vectors		Can obtain the equation of the sphere.	
		12th	Matrices		Can calculate the sum, difference, and product of matrices.	
		13th	Matrices		Can use the distributive and associative laws of matrices.	
		14th	Matrices		Can understand and use zero and identity matrices.	
		15th	Matrices		Can obtain the transposed matrix and the inverse matrix.	
		16th	Final exam		To check what you have learned so far.	
2nd Semester r	3rd Quarter	1st	Simultaneous linear equations and matrices		Understand the elimination method.	

		2nd	Simultaneous linear equations and matrices	Can solve simultaneous equations using the elimination method.
		3rd	Simultaneous linear equations and matrices	Can solve simultaneous equations using inverse matrices.
		4th	Simultaneous linear equations and matrices	Can compute the rank of a matrix.
		5th	Definition and properties of determinants	Understand the definition of determinants.
		6th	Definition and properties of determinants	Can compute determinants.
		7th	Overall	Can solve problems related to the content thus far.
		8th	Midterm exam	
	4th Quarter	9th	Definition and properties of determinants	Can compute determinants using their properties.
		10th	Definition and properties of determinants	Can compute the determinants of products of matrices.
		11th	Applications of determinants	Can expand determinants.
		12th	Applications of determinants	Can compute inverse matrices using determinants.
		13th	Applications of determinants	Can investigate the properties of simultaneous equations using determinants.
		14th	Applications of determinants	Understand the geometric meaning of determinants.
		15th	Overall	Can solve problems related to the content thus far.
		16th	Final exam	

#### Evaluation Method and Weight (%)

	Examination(fir st half)	Review quiz(first half)	assignments(fir st half)	Attendance(firs t half)	Examination(se cond half)	Quizzes and tsks(second half)	Total
Subtotal	23	12	8	7	30	20	100
Basic Proficiency	23	12	8	7	30	20	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0