

Anan College		Year	2024	Course Title	Applied Structural Mechanics
Course Information					
Course Code	5397C03		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Course of Electronics and Information Engineering		Student Grade	Adv. 2nd	
Term	Second Semester		Classes per Week	後期:2	
Textbook and/or Teaching Materials	Sakimoto Tatsuro : Kouzou Rikigaku [Dai 2 han・Shinsouban] Ge – Fuseiteihen – (Morikita Shuppan)				
Instructor	Moriyama Takuro				
Course Objectives					
1. The deflection of beam and the displacement of truss can be calculated by using the energy method. 2. The reaction force of statically indeterminate beam with low degree of indeterminacy can be calculated. 3. The displacement of point and the force of member on truss can be calculated by using matrix structural analysis. 4. The method for calculating the deflection and the reaction force of beam by using matrix structural analysis can be understood.					
Rubric					
	Ideal Level		Standard Level		Unacceptable Level
Achievement 1	The deflection of beam and the displacement of truss can be accurately calculated by using the energy method.		The deflection of beam and the displacement of truss can be almost calculated by using the energy method.		The overview of the method for calculating the deflection of beam and the displacement of truss by using the energy method can be understood.
Achievement 2	The reaction force of statically indeterminate beam with low degree of indeterminacy can be accurately calculated.		The reaction force of statically indeterminate beam with low degree of indeterminacy can be almost calculated.		The overview of the method for calculating the reaction force of statically indeterminate beam with low degree of indeterminacy can be understood.
Achievement 3	The displacement of point and the force of member on indeterminate truss can be accurately calculated by using matrix structural analysis.		The displacement of point and the force of member on static truss can be accurately calculated by using matrix structural analysis.		The overview of method for calculating the displacement of point and the force of member on static truss by using matrix structural analysis can be understood.
Achievement 4	The method for calculating the deflection and the reaction force of beam by using matrix structural analysis can be accurately understood.		The method for calculating the deflection and the reaction force of beam by using matrix structural analysis can be almost understood.		The overview of method for calculating the deflection of beam and the reaction force on beam by using matrix structural analysis can be understood.
Assigned Department Objectives					
B-3 D-1					
Teaching Method					
Outline	The concept of structural mechanics, which considers the deformation of an object when a load is applied, is important in the design of any structure. In this lecture, the first half of this lecture explains the energy method and the static structure as an application of the mechanics of materials and structural mechanics of this course, and the second half explains the matrix structure analysis method. The goal of this course is to deepen the understanding of these applied concepts of structural mechanics.				
Style	In class, we will explain as many examples as possible for each content, and we will give them exercises as homework as a review. [30 hours of class time + 60 hours of self-study time]				
Notice	In class, we will explain as many examples as possible for each content, and we will give them exercises as homework as a review. [30 hours of class time + 60 hours of self-study time]				
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	
2nd Semester r	3rd Quarter	1st	Calculation of deflection on beam by using the energy method	Able to understand the concepts of work and strain energy, as well as solutions using the law of conservation of energy.	
		2nd	Calculation of deflection on beam by using the energy method	Able to understand the principles of virtual work.	
		3rd	Calculation of deflection on beam by using the energy method	Able to understand the unit load method.	
		4th	Calculation of deflection on beam by using the energy method	Able to understand Castigliano's theorem and reciprocity theorem.	
		5th	Solution of statically indeterminate structure	Able to understand the overview and simple solutions of statically indeterminate structures.	
		6th	Solution of statically indeterminate structure	Able to understand simple solutions of statically indeterminate structures.	
		7th	Solution of statically indeterminate structure	Able to understand the deflection angle method and the triple moments method .	
		8th	【Midterm examination】		

	4th Quarter	9th	Matrix structural analysis of truss	Able to construct the stiffness equation of static truss.
		10th	Matrix structural analysis of truss	Able to solve the stiffness equation of static truss and to calculate unknown displacements and forces.
		11th	Matrix structural analysis of truss	Able to solve the stiffness equation of static truss and to calculate the elongation and strain of members.
		12th	Matrix structural analysis of truss	Able to construct stiffness equations of statically indeterminate trusses.
		13th	Matrix structural analysis of truss	Able to solve the stiffness equation and to calculate unknown displacements and forces of statically indeterminate truss.
		14th	Matrix structural analysis of beam	Able to construct the stiffness equation of beam.
		15th	Matrix structural analysis of beam	Able to solve the stiffness equation of beam, and to calculate unknown displacements and forces.
		16th	【Final examination】	【Final examination】

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	80	0	0	0	20	0	100
Basic Proficiency	40	0	0	0	10	0	50
Specialized Proficiency	40	0	0	0	10	0	50
Cross Area Proficiency	0	0	0	0	0	0	0