

Akashi College		Year	2022		Course Title	Structural Analysis ⅢB	
Course Information							
Course Code		4416		Course Category		Specialized / Compulsory	
Class Format		Lecture		Credits		School Credit: 1	
Department		Architecture		Student Grade		4th	
Term		Second Semester		Classes per Week		2	
Textbook and/or Teaching Materials		中川肇「基礎から学ぶ」建築構造力学 理論と演習からのアフ・ローチ」((株)井上書院)を使用する。(参考図書)鈴木基行著:構造力学徹底演習、森北出版					
Instructor		NAKAGAWA Hajime					
Course Objectives							
(1) To calculate the deformation and stress of a statically indeterminate structures using the principle of virtual work. (2) To calculate the stress of a statically indeterminate beam using the fixed moment method. To be able to draw the graph of the stress of a statically indeterminate beam.							
Rubric							
		Ideal Level		Standard Level		Unacceptable Level	
Achievement 1		Can well calculate the fulcrum reaction force and draw the stress graph of statically indeterminate structures using the displacement method (deflection angle method) and the fixed moment method.		Can calculate the fulcrum reaction force and draw the stress graph of statically indeterminate structures using the displacement method (deflection angle method) and the fixed moment method.		Can not calculate the fulcrum reaction force and draw the stress graph of statically indeterminate structures using the displacement method (deflection angle method) and the fixed moment method.	
Achievement 2		Can well use the principles of virtual work and energy to calculate the fulcrum reaction force, stress (graph), deformation (deflection, deflection angle) of a structure (beam, rigid frame, truss, etc.)		Can use the principles of virtual work and energy to calculate the fulcrum reaction force, stress (graph), deformation (deflection, deflection angle) of a structure (beam, rigid frame, truss, etc.)		Can not use the principles of virtual work and energy and can not calculate the fulcrum reaction force, stress (graph), deformation (deflection, deflection angle) of a structure (beam, rigid frame, truss, etc.)	
Achievement 3		Can well calculate the fulcrum reaction force of a statically indeterminate structure using principles for statically indeterminate structure, such as the virtual work method.		Can calculate the fulcrum reaction force of a statically indeterminate structure using principles for statically indeterminate structure, such as the virtual work method.		Can not calculate the fulcrum reaction force of a statically indeterminate structure using principles for statically indeterminate structure, such as the virtual work method.	
Assigned Department Objectives							
Teaching Method							
Outline		Structural analysis is the basis for building structure and structural design. The applied course follows Structural Analysis I (2nd year) and Structural Analysis III (3rd year). The students will acquire the main solving methods for statically indeterminate structures, displacement method (deflection angle method) and the fixed moment method. As part of the school global education, the tests and exercises are in English.					
Style		Lecture and problem-solving practice using textbook chapters 12 to15.					
Notice		To listen to the lectures and take notes. To solve exercise problems and understand them correctly. The students are supposed to ask questions and make sure they know the content before proceeding in the course. The students should review the topics learned in structural analysis courses I (2nd year) and II (3rd year). 5 absences will be excused.					
Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
2nd Semester	3rd Quarter	1st	Slope deflection method (1)		To understand the fundamental equation of the slope deflection method of a non-statically rigid frame structure.		
		2nd	Slope deflection method (2)		To calculate the stress of a non-statically determinate beam.		
		3rd	Slope deflection method (3)		To understand the joint equilibrium moment equation, through a calculation example of non-statically continuous beams and rigid frame structure using the slope deflection method.		
		4th	Slope deflection method (4)		To practice with exercises of non-statically determinate beams using the deflection method.		
		5th	Slope deflection method (5)		To understand the equivalent stiffness ratio, distribution and carry over factors of the structural member.		
		6th	Slope deflection method (6)		To understand the equivalent stiffness ratio, distribution and carry over factors of the beam and column.		
		7th	Slope deflection method (7)		To review the content learned		
		8th	Assignment (5)				
	4th Quarter	9th	Mid-term Exam				
			Slope deflection method (8)		To calculate a statically indeterminate rigid frame with supports that move.		

	10th	Slope deflection method (9)	To calculate a statically indeterminate rigid frame with supports that move.
	11th	Fixed end moment method (1)	To understand the principles and the graphs of fixed end method (FEM). To solve an example model of a non-statically continuous beam using FEM.
	12th	Fixed end moment method (2)	To understand how to solve an example model of a non-statically rigid frame structure using Fixed end moment method (FEM).
	13th	Fixed end moment method (3)	To solve the problems at the end of the textbook chapter. To elucidate doubts about the content learned.
	14th	Fixed end moment method (4)	To solve problems related to the content learned.
	15th	Practice using past universities entrance examination problems.	To review the content learned
	16th	End-term Exam	

Evaluation Method and Weight (%)

	Examination	Assignments	Total
Subtotal	80	20	100
Basic Proficiency	0	0	0
Specialized Proficiency	80	20	100
Cross Area Proficiency	0	0	0