

Akashi College		Year	2022		Course Title	Special Problems in Structural Theory and Design A
Course Information						
Course Code	4521			Course Category	Specialized / Elective	
Class Format	Lecture			Credits	School Credit: 1	
Department	Architecture			Student Grade	5th	
Term	First Semester			Classes per Week	2	
Textbook and/or Teaching Materials	Hand outs, 柴田明德:最新耐震構造解析 第2版、森北出版					
Instructor	NAKAGAWA Hajime					
Course Objectives						
(1) Historical review of earthquake damage in timber construction, earthquake resistance diagnosis, and new technologies. (2) The types and structure formats of timber construction. Material types and its characteristics, and how to can calculate wall quantity and eccentricity. (3) The positioning, design methods, and implementation methods of PC construction in a concrete system structure, and to calculate cross-sectional for simple PC structures.						
Rubric						
	Excellent		Good		Insufficient	
Achievement 1	The student can perfectly understand earthquake damage in timber construction, earthquake resistance diagnosis, and new technologies.		The student can earthquake damage in timber construction, earthquake resistance diagnosis, and new technologies.		The student can not earthquake damage in timber construction, earthquake resistance diagnosis, and new technologies.	
Achievement 2	The student can well understand types and structure formats of timber construction. Material types and its characteristics, and how to can calculate wall quantity and eccentricity.		The student can understand types and structure formats of timber construction. Material types and its characteristics, and how to can calculate wall quantity and eccentricity.		The student can not types and structure formats of timber construction. Material types and its characteristics, and how to can calculate wall quantity and eccentricity.	
Achievement 3	The student well understands the positioning, design methods, and implementation methods of PC construction in a concrete system structure, and can calculate the cross-sectional for simple PC structures.		The student understands the positioning, design methods, and implementation methods of PC construction in a concrete system structure, and can calculate the cross-sectional for simple PC structures.		The student doesn'tthe positioning, design methods, and implementation methods of PC construction in a concrete system structure, and can calculate the cross-sectional for simple PC structures.	
Assigned Department Objectives						
Teaching Method						
Outline	The study of structural mechanics is essential because it is the base to understand architectural structures and structural design. In this course, the students acquire the fundamental knowledge of structural mechanics and the stress of a static structure.					
Style	The classes are on the lecture-style lecture, exercises and assignment will be executed as appropriate.					
Notice	This course requires 90 hours of self-study time to do preliminary reviews, reviews, and assignments. Students attendance is required, and only a maximum of 5 absences is 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 checked="" type="checkbox"/> Instructor Professionally Experienced	
Course Plan						
			Theme	Goals		
1st Semester r	1st Quarter	1st	Force (1): Outline of structural mechanics, display of force and moment	To understand the definition and units of force, to understand and calculate force synthesis/decomposition.		
		2nd	Force (2): Synthesis and decomposition of forces, balancing of forces	To understand the definition and units of force, to understand and calculate force synthesis/decomposition. To understand and calculate the balance of force.		
		3rd	Architectural Structure (1): The composition of building structures, fulcrum, and node.	To explain the type of load acting on a frame structure.		
		4th	Architectural Structure (2): Stability / instability, reaction force.	To understand the stability and instability of a structure.To calculate the reaction force of various structures.		
		5th	The stress of a Structure (1): Concept and how to calculate it.	To calculate the stress of a static beam and draw a stress diagram.		
		6th	The stress of a Structure (2): Relationship between load, bending moment and shearing force	To calculate the stress of a static beam and draw a stress diagram.		
		7th	The stress of a Structure (3): How to calculate the stress	To calculate the stress of a static beam and draw a stress diagram.		
		8th	Mid-term Exam			
	2nd Quarter	9th	Static Beams (1): Outline of Static Beams, Solving to Cantilever Beams	To calculate the stress of a static beam and draw a stress diagram.		

		10th	Static Beams (2): Solving simple beams	To calculate the stress of a static beam and draw a stress diagram.
		11th	Static Beams(3): Solving Gerber Beams	To calculate the stress of a static beam and draw a stress diagram.
		12th	Assignment 3-4: To aggregate the survey data and produce graphs using Microsft Excel (4)	To understand how to use essential functions with spreadsheet software.
		13th	Static Rigid Frame (1): Outline of Static Rigid Frame and Solving Cantilevered Rigid Frames	To calculate the stress of a static frame structure and draw a stress diagram.
		14th	Static Rigid Frame (2): Solving a simple Frame	To calculate the stress of a static frame structure and draw a stress diagram.
		15th	Static Rigid Frame (2): Solving a Hinge Frame	To be able to organize a presentation and the materials necessary to it using presentation software.
		16th	End-term Exam	

Evaluation Method and Weight (%)			
	Examination	Assignments	Total
Subtotal	70	30	100
Basic Proficiency	0	0	0
Specialized Proficiency	70	30	100
Cross Area Proficiency	0	0	0