

Akashi College		Year	2024	Course Title	Special Problems in Structural Theory and Design A
Course Information					
Course Code	6524		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	Distribute self-authored teaching materials and some paper. (Akinori Shibata: Latest Seismic Structural Analysis 3rd Edition, Morikita Publishing, 2014)				
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, reinforce concrete structures, and new technologies.		The student can earthquake damage in timber, reinforce concrete structures, and new technologies.		The student can not earthquake damage in timber, reinforce concrete structures, and new technologies.
Assigned Department Objectives					
Teaching Method					
Outline	Japan is one of the countries where many natural disasters occur. This course will focus on safe and secure buildings and civil engineering structures, and will provide classes from the perspectives of seismic engineering and disaster prevention engineering. It will teach the basics of seismic engineering and disaster prevention engineering in a lecture and exercise style by a teacher who was responsible for the structural design and earthquake response analysis of buildings at a company, using their experience.				
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. Students who miss 1/3 or more of classes will not be eligible for evaluation.				
Characteristics of Class / Division in Learning					
☐ Active Learning		☐ Aided by ICT		☒ Applicable to Remote Class	☒ Instructor Professionally Experienced
Course Plan					
			Theme	Goals	
1st Semester r	1st Quarter	1st	Class plans and guidance. Look back on the situation at the time of the Great Hanshin Earthquake and the Great East Japan Earthquake as examples, and lecture on future disaster prevention measures.	Can understand what to study in this course. Also, understand future disaster prevention measures in each field by learning about the two major earthquakes of the Heisei era.	
		2nd	A lecture and practical skill training on basic life support (cardiopulmonary resuscitation and how to use an AED) Explain, demonstrate, and develop a deep understanding of cardiopulmonary resuscitation and how to use an AED, which are both aids in the event of a disaster or traffic accident.	Can understand the need for basic life support and can perform cardiopulmonary resuscitation and use an AED.	
		3rd	Recent earthquake events in Japan and overseas (1) Explain the mechanism of earthquakes and lecture the human and building damages of Hanshin Awaji great earthquake using the text and photo.	Can understand the mechanism of earthquakes, the human and building damages of Hanshin Awaji great earthquake	
		4th	Recent earthquake events in Japan and overseas (2) lecture the human and building damage of Hanshin Awaji great earthquake using the text and photo.	Can understand the human and building damage of Hanshin Awaji great earthquake	
		5th	Recent earthquake events in Japan and overseas (3) Explain the earthquakes that have occurred within the last 20 years, and lecture on future disaster prevention measures.	Can understand the summary of earthquakes that have occurred within the last 20 years and the future disaster prevention measures.	
		6th	The summary of seismic engineering and the free vibration of single-degree-freedom-model.	Can understand the summary of seismic engineering and the free vibration of single-degree-freedom-model.	
		7th	The free vibration with the damping of single-of-freedom-model.	Can understand the free vibration with the damping of single-degree-freedom-model.	
		8th	The assignment about the disaster prevention and seismic engineering through from 1 week to 6 weeks.	Can understand the contents from 1 week to 7 weeks through the assignment.	

	2nd Quarter	9th	The earthquake response analysis	Can understand how to solve 3 responses by using the New Mark beta method.
		10th	The relationship of earthquake ground motion and response spectrum	Can understand the relationship of earthquake ground motion and response spectrum
		11th	The motion equation of multi-degree-freedom-models and eigen value analysis	Can derive the motion equation of multi-degree-freedom-models and determine these values using the eigen value analysis.
		12th	The seismic design method in Japan	Can understand the seismic design method in Japan.
		13th	The summary of seismic, base isolates and passive controlled structures. These design methods	Can understand the difference of seismic, base isolates and passive controlled structures.
		14th	The assignment	Can understand the contents from 9th weeks to 13th weeks through the assignment.
		15th	Presentation of the report	Can present and discuss the assignments conducted by each other.
		16th	Final exam	Can understand the contents from 1st and 14th weeks through the exam.

Evaluation Method and Weight (%)

	Examination	Assignments	report	Total
Subtotal	50	20	30	100
Basic Proficiency	0	0	0	0
Specialized Proficiency	50	20	30	100
Cross Area Proficiency	0	0	0	0