

Akashi College		Year	2022		Course Title	Engineering Topics for Advanced Course Students
Course Information						
Course Code		4008		Course Category	Specialized / Compulsory	
Class Format		Lecture		Credits	Academic Credit: 2	
Department		Architecture and Civil Engineering		Student Grade	Adv. 1st	
Term		Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials						
Instructor		KANDA Keiichi,HIRAISHI Toshihiro,NAKANISHI Hiroshi,NOMURA Hayato,ONISHI Shosaku				
Course Objectives						
(1) Understand the latest technological issues in one's own area of specialty, their solutions and the status of their efforts. (2) Learn about the latest issues in areas different from one's own area of specialty. (3) Learn and understand topics about technologies and research that are co-existence friendly in each area of specialty.						
Rubric						
		Ideal Level	Standard Level		Unacceptable Level	
Achievement 1		Understand the latest technological issues in one's own area of specialty, their solutions and the status of their efforts.	Understand the latest technological issues in one's own area of specialty, their solutions and the status of their efforts.		Do not understand the latest technological issues in one's own area of expertise, their solutions and the status of their efforts.	
Achievement 2		Learn about the latest issues in areas different from one's own area of specialty.	Learn about the latest issues in areas different from one's own area of specialty.		Do not learn about the latest issues in areas different from one's own area of specialty.	
Achievement 3		Learn and understand topics about technologies and research that are co-existence friendly in each area of specialty.	Learn and understand topics about technologies and research that are co-existence friendly in each area of specialty.		Do not learn and understand topics about technologies and research that are co-existence friendly in each area of specialty.	
Assigned Department Objectives						
Teaching Method						
Outline		In order to broaden students' backgrounds as an engineers, it is important for them to actively learn not only their own areas of specialty but learn other areas, too. In this course, faculty members from different areas of expertise will give knowledge of the trends in technological development in an interdisciplinary manner both inside and out of this course. Classes will cover various topics and take place in a relay form: Nakanishi: Guidance and interdisciplinary area(three classes) Onishi: Mechanical systems (three classes) Nomura: Electronic and information systems (three classes) Kanda: Urban systems (three classes) Hiraishi: Building system (three classes) By learning about various development and research processes, students will develop universal thinking and flexible development capabilities beyond their respective technical fields.				
Style		Of the 15 week-period, Nakanishi will teach the guidance in week 1 in a lecture-style format. Onishi will teach classes from weeks 2 to 4 in a lecture-style format. Nomura will teach classes from weeks 5 to 7 in a lecture-style format. Kanda will teach classes from weeks 8 to 10 in a lecture-style format. Hiraishi will teach classes from weeks 11 to 13 in a lecture-style format. In weeks 14 and 15, Nakanishi will teach classes in the form of off-campus exercises.				
Notice		This course's content will amount to 90 hours of study in total. These hours include the learning time guaranteed in classes and the standard self-study time required for pre-study / review, and completing assignment reports. Although there will be many topics outside of students' own specialties, they will be explained in a way that is easy to understand, so students should be able to properly learn them. Students who miss 1/5 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 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	Course aims (Nakanishi) Explain the purpose of Engineering Topics for Advanced Course Students. Inform the evaluation methods and other details. Explain the importance of actively learning a wide range of knowledge through self-experience, recent science and technology topics, etc.		Understand an overview of this class and create a pre-learning plan.	
		2nd	Lecture on the basics of mechanical materials, and on the method of tensile testing to obtain a material's representative properties and the meaning of the material properties obtained from that. (Onishi)		Can explain the basics of materials science, such as crystal structure and dislocation. Can also explain tensile testing and properties.	
		3rd	Lecture on fracture toughness and fatigue properties of metal materials. Requirements for machinery and equipment are becoming sophisticated in recent years, and as a result, their fracture behaviors that have to do with fracture toughness and fatigue are increasing. Lecture on the basic knowledge of the metals used in machinery and equipment. (Onishi)		Can explain the use and meaning of fracture toughness and fatigue properties.	

		4th	Lecture on the concept of material selection for machinery and equipment. Metals (ferrous and non-ferrous) and plastic are used in machinery and structures, and one must have various viewpoints when selecting materials that fit the purpose. Lecture on the vital points on those viewpoints. (Onishi)	Can explain the necessary viewpoints for material selection for the design of machinery and equipment (including functional materials) and structures.
		5th	Information visualization 1 (Nomura) Learn about systems and concepts for data analysis and applications, with the subject of a database of gathered information on the relationship between engineering elements and products.	Can explain structuring for visualization.
		6th	Information visualization 2 (Nomura) Learn about mechanical information extraction and organization based on text mining and formatting.	Can implement methods for extracting and formatting the desired information from a large amount of data.
		7th	Information visualization 3 (Nomura) Select a field from the database of engineering elements and do visualizing exercises.	Can extract and visualize information from the database according to one's own objectives.
		8th	Global environmental problems 1 (Kanda) Environmental deterioration can affect the health and comfort of people in the future and in other regions. Through group discussions, discuss regional and intergenerational disparities in environmental deterioration.	Can fully understand and explain the regional and intergenerational disparities of environmental deterioration to others through group discussions.
	4th Quarter	9th	Global environmental problems 2 (Kanda) Outline the mechanism of global warming and its impact on the ecosystem, and examine the current status of greenhouse gas concentrations and their sources, distribution, and migration forms.	Fully understand and can explain to others the mechanism of global warming, its impact on the ecosystem, and the current status of greenhouse gas concentrations and their sources, distribution, and migration forms.
		10th	Global environmental problems 3 (Kanda) Outline the mechanism of ozone layer depletion and its impact on the ecosystem, and think about the locations and distribution of ozone holes and predictions and countermeasures for their future growth.	Fully understand and can explain to others the mechanism of ozone layer depletion and its impact on the ecosystem, the locations and distribution of ozone holes, and predictions and countermeasures for their future growth.
		11th	Assistance for developing countries and disaster areas (Hiraishi) Give an introduction on assistance for developing countries and disaster areas that have been provided so far, and consider the way in which technologies can be applied to local characteristics in the global community.	Can recognize the importance of local characteristics also in a globalized society.
		12th	Appropriate technology (Hiraishi) Give an introduction on the need for appropriate technology, examples of its application in developing countries and those in environmental measures in Japan to think about the way technology should work.	Can explain the definition of appropriate technology and give examples of it.
		13th	Recycling and benefits of biological organics (Hiraishi) Explain how to treat biological organic materials such as fallen leaves, weeds, woods, food waste, and human waste, and how the system for a recycling-based society should work.	Can explain examples of material recycling in a recycling-based society.
		14th	Interdisciplinary area 1 (Nakanishi) As a summary of this course, learn about a wide range of the latest science and technology, including shipbuilding, navigating, communicating, port and city planning, through an exercise on board the Graduate School of Maritime Sciences Kobe University's training ship, KAIJINMARU.	Can organize and explain the knowledge gained through the on-board exercise.
		15th	Interdisciplinary area 2 (Nakanishi) As a summary of this course, learn about a wide range of the latest science and technology, including shipbuilding, navigating, communicating, port and city planning, through an exercise on board the Graduate School of Maritime Sciences Kobe University's training ship, KAIJINMARU. The will be an intensive course combined with week 14.	Can organize and explain the knowledge gained through the on-board exercise.
		16th	No final exam	

Evaluation Method and Weight (%)

	Report	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	90	0	0	10	0	0	100
Basic Proficiency	20	0	0	10	0	0	30
Specialized Proficiency	30	0	0	0	0	0	30

Cross Area Proficiency	40	0	0	0	0	0	40
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