Akashi College		Year	2023		Course Title	Engineering Topics for Advanced Course Students

Course Information

Course Code	5008		Course Category	Specialized / Compulsory
Class Format	Lecture		Credits	Academic Credit: 2
Department	Mechanical and Electronic System Engineering		Student Grade	Adv. 1st
Term	Second Semester		Classes per Week	2
Textbook and/or Teaching Materials				
Instructor	FUJIWARA Seiji,WATANABE Moriyoshi,HIRAISHI Toshihiro,NAKANISHI Hiroshi,NOMURA Hayato			

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) Fujiwara: Mechanical systems (three classes) Nomura: Electronic and information systems (three classes) Watanabe: 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. Fujiwara 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. Watanabe 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 evaluation.

Characteristics of Class / Division in Learning

☑ Active Learning	☐ Aided by ICT	☑ Applicable to Remote Class	☐ 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	Thermal Fluid Problems in Engineering Problems related to thermal fluid are faced everywhere in engineering, such as cooling of housing and electronic equipment. This lecture will discuss the basic laws of such thermal problems. (Fujiwara)	Can understand the basic laws of heat conduction and heat transfer, and be able to perform basic thermal calculations.
		3rd	Practical Thermal Problem Analysis When performing a hand-calculation level analysis of a thermal problem, it is necessary to model and simplify the actual thermal problem. Modeling of each element for practical thermal problems will be discussed. (Fujiwara)	Can model each element and perform thermal calculations for practical thermal problems.

		4th	Challenges in Analyzing Thermo-Fluid Problems To perform analysis of thermal problems at the hand-calculation level, thermophysical properties, heat transfer coefficients, and other values are required. We will understand the process of constructing such a database and discuss guidelines for more complex thermal problems. (Fujiwara)	Can discuss the procedures for obtaining non-databased physical properties and heat transfer coefficients.
		5th	Automation 1 (Nomura) Learn about the concept of work automation, using existing cases as materials.	Can explain events that can be automated.
		6th	Automation 2 (Nomura) Learn about platforms used for programmatic automation.	Can explain a platform used for programmatic automation.
		7th	Automation 3 (Nomura) Learn how to clarify the procedure to automate a task, consider the form of the output, and realize it through programming.	Can explain procedures for automating repetitive tasks in research activities and daily routines through programs.
		8th	Development and Environment(Watanabe)	Can explain the impact of development activities on the environment, and the disaster prevention function of the nature.
	4th Quarter	9th	Environmental load and Environmental impact assessment method(Watanabe)	Can explain indicators, life cycle assessment(LCA), and environmental impact assessment methods related to the impact of human activities on the environment.
		10th	Environmental Risk and Ethics(Watanabe)	Can explain the three environmental ethics of natural subsistence, inter-generational ethics, and resource finiteness, as well as the trilemma of environmental risks and environmental problems.
		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