Anan College	Year	2024	Course Title	Material Processing

Course Information

Course Code	5496M03	Course Category	AC / Elective
Class Format	Lecture	Credits	Academic Credit: 2
Department	Course of Civil Engineering	Student Grade	Adv. 1st
Term	First Semester	Classes per Week	前期:2
Textbook and/or Teaching Materials	Materials will be distributed as needed.		
Instructor	Yasuda Takeshi		

Course Objectives

1. Student be able to understand and explain various processing methods for metallic materials and their characteristics and relevance.
2. Student be able to understand and explain various molding methods for ceramics, resins, and composite materials, and their characteristics.
3. Student be able to understand and explain heat treatment and surface treatment, their necessity and effects.
4. Student be able to understand and explain various joining methods and their characteristics.

Rubric

	Ideal Level	Standard Level	Minimum Level
Achievement 1	Student be able to understand and explain various processing methods of metallic materials and their characteristics and relevance.	Student be able to understand and explain various processing methods for metallic materials.	Student understand various processing methods for metal materials.
Achievement 2	Student be able to understand and explain various molding methods for ceramics and resins/composites and their characteristics.	Student be able to understand and explain various forming methods for ceramics and resins/composites.	Student understand various molding methods for ceramics, resins and composites.
Achievement 3	Student be able to understand and explain the necessity and effects of heat treatment and surface treatment.	Student be able to understand and explain heat treatment and surface treatment.	Student understand heat treatment and surface treatment heat treatments.
Achievement 4	Student be able to understand and explain various joining methods and their characteristics.	Student be able to understand and explain various joining methods.	Student understand various joining methods.

Assigned Department Objectives

D-1

Teaching Method

Outline	Metallic materials (especially steel), ceramics, and resins, which are widely utilized in industrial products, are processed into various shapes according to their applications. As engineers and designers involved in manufacturing, it is necessary to understand the phenomena and characteristics of various materials during processing in order to select appropriate material processing methods. In this course, students will acquire basic knowledge of various processing and forming methods for metallic materials, ceramics, and resins, as well as heat treatment and surface treatment of some materials.
Style	Classes will be conducted in a lecture style. Reports will be required as pre- and post-assessments. [30 hours of class time + 60 hours of self-study]
Notice	

Characteristics of Class / Division in Learning

☐ Active Learning	☐ Aided by ICT	☐ Applicable to Remote Class	☐ Instructor Professionally Experienced

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Overall view of material processing methods	Student be able to explain an overview of this course and an view overall how materials are processed.
		2nd	Processing methods for metallic materials	Student be able to explain various processing methods for metallic materials.
		3rd	Processing methods for metallic materials	Student be able to explain various processing methods for metallic materials.
		4th	Ceramics forming methods	Student be able to explain ceramics forming methods.
		5th	Molding methods for resins and composites	Student be able to explain molding methods for resins and composites.
		6th	Basics of heat treatment	Student be able to explain the basics of heat treatment of steel materials.
		7th	Basics of heat treatment	Student be able to explain the basics of heat treatment of steel materials.
		8th	Heat treatment in actual	Student be able to explain heat treatment in actual.
	2nd Quarter	9th	Midterm examination	
		10th	Surface Treatment	Student be able to explain various surface treatment methods.

		11th	Surface Treatment	Student be able to explain various surface treatment methods.
		12th	Mechanical bonding	Student be able to explain various mechanical bonding.
		13th	Adhesion	Student be able to explain about adhesion.
		14th	Liquid phase bonding and solid phase bonding	Student be able to explain various methods of liquid-phase bonding and solid-phase bonding.
		15th	Liquid phase bonding and solid phase bonding	Student be able to explain various methods of liquid-phase bonding and solid-phase bonding.
		16th	Final examination and return exam. paper	

Evaluation Method and Weight (%)

	Midterm/Final exam	Quiz	Portfolio	Presentation/Attitude	Portfolio	Other	Total
Subtotal	80	0	20	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	60	0	20	0	0	0	80
Cross Area Proficiency	20	0	0	0	0	0	20