Akashi College	Year	2023	Course Title	Design and DrawingⅣB

Course Information

Course Code	5426	Course Category	Specialized / Compulsory
Class Format	Practical training	Credits	Academic Credit: 2
Department	Mechanical Engineering	Student Grade	4th
Term	Second Semester	Classes per Week	2
Textbook and/or Teaching Materials			
Instructor	SHI Fenghui		

Course Objectives

(1) Learn about the design process up to machining through the planning, designing, and drawing of a two-stage three-axis gear decelerator, a typical turning machine consisting of various mechanical components such as gears, bearings, and axles. Can creatively plan the structure, shape, and dimensions that satisfy the performance and complete a gear decelerator drawing based on the design calculation of a gear decelerator they created in Design and Drawing IV A, to acquire comprehensive machine design skills.
(2) Create a plan drawing, part drawing, and assembly drawing with AutoCAD Mechanical.
(3) Learn to employ many different design and drawing methods for mechanical elements, and through repetition by reviewing the material, to independently drive design promotion and to learn how to use design reference materials and reference examples of machine design. Learn a wide range of design ideas including the importance of delivery time, to learn the necessity of and methods for continuous learning.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Can creatively plan the structure, shape, and dimensions that satisfy the performance of a gear decelerator and complete a gear decelerator drawing, to fully acquire comprehensive machine design skills.	Can creatively plan the structure, shape, and dimensions that satisfy the performance of a gear decelerator and complete a gear decelerator drawing, to acquire comprehensive machine design skills.	Cannot creatively plan the structure, shape, and dimensions that satisfy the performance of a gear decelerator and complete a gear decelerator drawing, to acquire comprehensive machine design skills.
Achievement 2	Can fully complete a plan drawing, part drawing, and assembly drawing with AutoCAD Mechanical.	Can complete a plan drawing, part drawing, and assembly drawing with AutoCAD Mechanical.	Cannot complete a plan drawing, part drawing, and assembly drawing with AutoCAD Mechanical.
Achievement 3	Learn how to use reference examples of mechanical design, and a wide range of design ideas including the importance of delivery time, to fully learn the necessity of and methods for continuous learning.	Learn how to use reference examples of mechanical design, and a wide range of design ideas including the importance of delivery time, to learn the necessity of and methods for continuous learning.	Do not learn how to use reference examples of mechanical design, and a wide range of design ideas including the importance of delivery time, to learn the necessity of and methods for continuous learning.

Assigned Department Objectives

Teaching Method

Outline	Learn about the design process up to machining through the planning, designing, and drawing of a two-stage three-axis gear decelerator, a typical turning machine consisting of various mechanical components such as gears, bearings, and axles. In the first semester, students will learn how a mechanical design should be through lectures on technical calculations necessary for design. They will plan gear decelerators and prepare design calculations, and recognize the importance of design calculations. In the second semester, students will creatively plan structures, shapes, and dimensions in a manner that was given to them to satisfy the performance given, then design using AutoCAD Mechanical, to acquire comprehensive machine design skills. This course will be held in a lecture and lab style and taught by an instructor who is in charge of machine design in a company using his experience. Based on the design calculations for a helical gear decelerator completed in Design and Drawing IV A, it will teach how to use AutoCAD Mechanical, and how to create a planning drawing and assembly drawing of a helical gear reducer, and a part drawing of axes and helical gears.
Style	Students will create drawings for major parts based on the design calculation of a helical gear decelerator they designed in Design and Drawing IV A, using CAD. Classes will be conducted in a lab style.
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 preparation / review, and completing assignment reports. (1) Understand why design calculations are necessary, and learn how to write design calculations that others can understand. (2) Learn the importance of creativity by incorporating ideas and repeating trial-and-errors to realize specifications to satisfy the original purposes. (3)Recognize the importance of delivery time. 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
2nd Semester	3rd Quarter	1st	Creating planning drawing (1)	Learn how to create a planning drawing for a two-stage three-axis gear decelerator and review the operation of AutoCAD Mechanical 2014.
		2nd	Creating planning drawing (2)	Develop design concepts by showing their models based on a three-dimensional drawing and design calculations of a helical decelerator created by each student.

		3rd	Creating planning drawing (3)	Can make progress in drafting with attention to the shaft, gear, bearing mounting method, and casing structure.
		4th	Creating planning drawing (4)	Learn things to be careful about in creating a planning drawing.
		5th	Creating planning drawing (5)	Can dimension a planning drawing to complete a planning drawing.
		6th	Creating a production drawing and part drawing (1)	Can explain how to draft a production drawings of the input, intermediate and output axes, and create part drawings based on respective plans of students.
		7th	Creating a production drawing and part drawing (2)	Can explain how to draft a production drawings, and create part drawings based on respective plans of students.
		8th	Creating a production drawing and part drawing (3)	
	4th Quarter	9th	Creating a production drawing and part drawing (4)	Explain how to draft a production drawings of the gear, and promote drafting of production drawings of the gear. Can modify the inspected drawings and complete the part drawing.
		10th	Creating a production drawing and part drawing (5)	Can explain how to draft production drawings of small-item parts such as the design and drawing guidelines for small-item parts such as bearing holder, and can promote drafting.
		11th	Creating a production drawing and part drawing (6)	Can explain how to draft production drawings of small-item parts such as the design and drawing guidelines for small-item parts such as bearing holder, and can promote drafting.
		12th	Creating a production drawing and part drawing (7)	Can create and promote drafting of production drawings and casing drawings.
		13th	Creating a production drawing and part drawing (8)	Can create and promote drafting of production drawings and casing drawings.
		14th	Creating a production drawing and part drawing (9)	Can create and complete production drawings and casing drawings.
		15th	Creating an assembly drawing	Can explain making of assembly drawings. Learn and acquire reference number, part list, etc. Revise the planning drawing and complete it as an assembly drawing, and review it as a class.
		16th	No final exam	

Evaluation Method and Weight (%)

	Drawing	Behavior	Total
Subtotal	90	10	100
Basic Proficiency	0	0	0
Specialized Proficiency	90	10	100
Cross Area Proficiency	0	0	0