Tsuyama College		Year	2020		Course Title	Machine Design Creative Practice

Course Information

Course Code	0097		Course Category	Specialized / Elective
Class Format	Seminar		Credits	Academic Credit: 2
Department	Department of Integrated Science and Technology Communication and Informations System Program		Student Grade	4th
Term	Second Semester		Classes per Week	2
Textbook and/or Teaching Materials	Textbooks :Exercises are distributed separately.			
Instructor	SHIOTA Hirohisa			

Course Objectives

Learning purposes : Acquire the ability to solve problems in mechanical engineering by utilizing general-purpose software.

Course Objectives :
1. To solve mechanical engineering problems using general-purpose programs.
2. To consider appropriate analysis conditions for problems.
3. To acquire necessary information from analysis results.

Rubric

	Excellent	Good	Acceptable	Not acceptable
Achievement 1	Solve mechanical engineering problems and explain their contents using a general-purpose program.	Solve problems in mechanical engineering by using general-purpose programs.	Solve simple problems in mechanical engineering by using general-purpose programs.	Not reached to the left.
Achievement 2	Be able to select appropriate analysis conditions for the problem and explain it physically.	Be able to select appropriate analysis conditions for the problem.	Be able to select appropriate analysis conditions for the problem with advice	Not reached to the left.
Achievement 3	Able to obtain the necessary information from the analysis results and explain them physically.	Able to obtain necessary information from the analysis results appropriately.	Able to obtain simple information from the analysis results.	Not reached to the left.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : Specialized Field of learning : Material, Design and Manufacturing Required, Elective, etc. : Elective must complete subjects Foundational academic disciplines : Engineering/Mechanical engineering Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area". Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-2", also "D-1" and "F-2" is involved. Course outline : Basic problems of mechanical engineering are analyzed by using CAD or general analysis software.
Style	Course method : The class is conducted using PC, projector and blackboard. Students are required to analyze their own work using general-purpose software. Students are required to submit a report, and they may be required to take an oral examination to confirm their understanding of the subject. Grade evaluation method : Grading will be based on the average of the scores of each report. All reports must be submitted, and no credit will be given if there is one report not submitted.
Notice	Precautions on the enrollment : This is a "class that requires study outside of class hours". Classes are offered for 15 hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies. Course advice : Students learn how to solve basic mechanical engineering problems using different tools. Students are required to have a basic knowledge of the original discipline in order to read the data necessary for design from the analysis results. Foundational subjects : Introduction to CAD (2nd year), Machine Design and Drawing Ⅰ (2nd), Materials Technology(2nd), Design of Machine Elements Ⅰ (3rd), Strength of Materials Ⅰ (3rd), Machine Design and Drawing Ⅱ (3rd) Related subjects : Design of Machine Elements Ⅱ (4th year), Strength of Materials Ⅱ (4th), Graduation Thesis(5th) Attendance advice : It is essential to understand the basic knowledge of the original discipline in order to read the data necessary for design from analysis results. Students are encouraged to review CAD and other tools on their own to familiarize themselves with their use.

Course Plan

			Theme		Goals

2nd Semester	3rd Quarter	1st	Guidance [schedule, preparation, precauti+C3:C17ons, etc.] Confirmation of the fundamentals of material mechanics	Understand the definitions and concepts of stress and deformation.
		2nd	Confirmation of the fundamentals of material mechanics	Understand the definitions and concepts of stress and deformation.
		3rd	Basic operation of 3D-CAD	To understand the basic functions of a CAD system.
		4th	How to draw a simple bar and analyze its structure.	To understand the role and basic functions of a CAD system.
		5th	Structural analysis of a simple bar (3D-CAD drawing)	To understand the role and basic functions of a CAD system
		6th	Structural analysis of a simple bar (3D-CAD drawing and analysis procedure)	To understand the role and basic functions of a CAD system.
		7th	Structural analysis of a simple bar (display and meaning of the analysis results)	To understand the role and basic functions of a CAD system.
		8th	Comparison with mechanical engineering (mechanics of materials)	To understand the role and basic functions of a CAD system. To understand the meaning of allowable stresses and stress concentrations.
	4th Quarter	9th	Data organization and reporting	To understand the meaning of allowable stresses and stress concentrations.
		10th	Drawing of a beam with complex shapes	To understand the role and basic functions of a CAD system.
		11th	Drawing of a beam with complex shapes	To understand the role and basic functions of a CAD system.
		12th	Structural analysis of complexly shaped beams	To understand the role and basic functions of a CAD system.
		13th	Display and discussion of analysis results	To understand the meaning of allowable stress, safety factor, and stress concentration.
		14th	Comparison with mechanical engineering (mechanics of materials)	To understand the meaning of allowable stress, safety factor, and stress concentration.
		15th	Data organization and reporting	To understand the meaning of allowable stresses, safety factor, and stress concentration.
		16th	Report generation	To understand the meaning of allowable stresses, safety factor, and stress concentration.

Evaluation Method and Weight (%)

	Report	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	100	0	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	100	0	0	0	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0