Tsuyama College	Year	2021	Course Title	Materials Processing

Course Information

Course Code	0161	Course Category	Specialized / Elective
Class Format	Lecture	Credits	Academic Credit: 2
Department	Department of Integrated Science and Technology Electrical and Electronic Systems Program	Student Grade	5th
Term	Second Semester	Classes per Week	2
Textbook and/or Teaching Materials	Textbooks : Kazuo Nakayama and Kunio Uehara, "Machine Processing, New Edition" (Asakura Shoten)		
Instructor	SEKI Ichiro		

Course Objectives

Learning purposes :
It is one of the missions of a mechanical engineer to "manufacture good products quickly and economically". Therefore, it is necessary for a machine engineer to have the ability to plan an appropriate and rational process based on the knowledge of the basic characteristics of various machining methods. In machining, students are expected to be able to select an appropriate and rational means of manufacturing and to set appropriate working conditions.

Course Objectives :
1. To understand the basic engineering method for mechanical material and mother machines.
2. To be able to explain the model of removal processing after understanding the phenomenology of removal processing.
3. To be able to demonstrate guidelines for selecting mother machines and machining conditions based on knowledge of the basic characteristics of removal processing.
4. To be able to demonstrate guidelines for reasonable solutions to problems that may occur during processing.

Rubric

	Excellent	Good	Acceptable	Not acceptable
Achievement 1	To be able to explain the principle of cutting machining and the mechanism of workpiece shape creation based on the movement of mother machine, works, and cutting tools.	To be able to explain the mechanism of cutting operations. To be able to explain the relationship between mother machines, tools and works.	Be able to explain the principles of simple cutting operations.	Has not reached the Acceptable level.
Achievement 2	To understand the cutting mechanism and its model, and to be able to explain the chip morphology, cutting resistance, and heat generation by cutting.	To be able to explain the model after understanding the phenomenon of the removal process.	The removal process model can be mentioned.	Has not reached the Acceptable level.
Achievement 3	To be able to demonstrate guidelines for selection of mother machines and machining conditions based on knowledge of the basic characteristics of removal processing.	Be able to explain how mother machines and machining conditions are determined in relation to the shape, quality, cost and machining time of the work.	The processing conditions can be selected.	Has not reached the Acceptable level.
Achievement 4	Be able to explain the relationship between machining conditions and machining accuracy of works. Be able to demonstrate guidelines for reasonable solutions for improving machining accuracy and productivity.	Be able to explain the relationship between machining conditions and the effect of material properties on the machining accuracy of a work.	Be able to explain the relationship between processing conditions and changes in material properties.	Has not reached the Acceptable level.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : Specialized Field of learning : Materials, Design and Production/others Foundational academic disciplines : Engineering／Mechanical engineering／Industrial engineering Relationship with Educational Objectives : This class is equivalent to (4) Develop multi-disciplinary ability,(5) Attain a global perspective and understanding of social development,(6) Develop problem solving ability and (7) Develop communication and presentation abilities. Relationship with JABEE programs : The main goals of learning / education in this class are (A), A－2. Course outline : This course mainly deals with removal processing (machining using mother machines, and students learn various machining methods, their principles and characteristics, and the basic theory of machine tools as the basic knowledge for engineers studying mechanical engineering. In addition, based on the knowledge acquired through laboratory experiments, machining techniques and their significance are reviewed.

Style	Course method : The class is taught mainly on the board, paying attention to the relation to what was learned in the laboratory exercises. In addition, assignments will be given according to the students' progress in order to deepen their understanding. Grade evaluation method : The results of the two regular examinations will be evaluated equally (70%). Students are not allowed to bring textbooks and notebooks to the examinations. Students will be required to submit assignments (30%) as appropriate.
Notice	Precautions on the enrollment : This course is a mandatory course with 15 credit hours per credit, plus 30 credit hours of study per credit. Students must follow the instructions of the instructor. Course advice : It is necessary to study the textbook and reference materials in preparation for the laboratory exercises. Students are expected to solve exercises to deepen their understanding. Foundational subjects : Introduction to Science and Engineering (1st year), Science and Engineering Laboratory (1st), Mechanical Systems Engineering Laboratory I (Mechanical 2nd), Materials Science (Mechanical 2nd), etc. Related subjects : Graduate Studies (5th years), Production Engineering (5th), Special Experiments (advanced course 1st year), and Precision Machining (advanced course 1st), etc. Attendance advice : In "Materials Processing", the understanding of technical terms and the principles and characteristics of manufacturing are compulsory for engineers studying mechanical engineering. Students are expected to keep in mind the relationship between design and manufacturing.

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	Closed this course in this year	
		2nd		
		3rd		
		4th		
		5th		
		6th		
		7th		
		8th		
	4th Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Work・Reports	Quiz	Total
Subtotal	70	0	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0	0