

Tsuyama College		Year	2020		Course Title	Electrical and Electronic Materials	
Course Information							
Course Code	0110		Course Category		Specialized / Compulsory		
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 :Electrical and electronic materials(Denki Shoin),"Ito Kunio and Harada Kanji , Reference books :						
Instructor	HARADA Kanji						
Course Objectives							
Learning purposes : By not only acquiring knowledge of materials, but also deepening the physical understanding of the physics that bring about their properties, we will fully understand the advantages and weaknesses of materials so that we can use the right materials in the right places. Course Objectives : 1. To explain physical properties such as conductivity, insulation, and magnetism. 2. To explain the knowledge of materials used in each application. 3. To explain materials while considering economic efficiency as well as physical properties.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	Can explain physical properties such as conductivity, semiconductors, and magnetism, and calculate problems related to those materials.		Can explain physical properties such as conductivity, semiconductors, and magnetism, and solve calculation problems for some materials.		Can explain physical properties such as conductivity, semiconductors, and magnetism, and using lecture notes can solve calculation problems related to some materials.		Student cannot explain the physical properties of conductivity, semiconductors, magnetism, etc., and even with lecture notes cannot solve calculation problems related to some materials.
Achievement 2	Can explain the materials used in each application and calculate problems related to the materials.		Can explain the materials used in each application and solve calculation problems for some materials.		Can explain the materials used in each application, and with lecture notes can solve calculation problems related to some materials.		For some materials used in each application, it is not possible to explain the materials that take into consideration the rough physical properties.
Achievement 3	Can explain the materials used in each application not only in terms of physical properties but also in consideration of economic efficiency.		For some materials used in each application, can roughly explain the physical properties and materials taking economic efficiency into consideration.		Can explain some materials used in each application, considering the rough physical properties.		For some materials used in each application, it is not possible to explain the materials that take into consideration the rough physical properties.
Assigned Department Objectives							
3							
Teaching Method							
Outline	Can explain physical properties such as conductivity, semiconductors, and magnetism, and calculate problems related to those materials.						
Style	Can explain the materials used in each application and calculate problems related to the materials.						
Notice	Can explain the materials used in each application not only in terms of physical properties but also in consideration of economic efficiency.						
Course Plan							
			Theme		Goals		
2nd Semester	3rd Quarter	1st	Guidance Basics of materials science		Substances and materials		
		2nd	Conduction phenomenon of metal and porosity		Electron scattering and resistance		
		3rd	Volume ratio between the number of particles in the lattice and the sphere		Pore rate & volume rate		
		4th	Conductive and insulating materials		Insulation with conductor		
		5th	Resistor material		Resistors and fuses		
		6th	Basics of superconductors		Resistance and electron pair		
		7th	Applications of superconducting materials and superconducting materials		MRI and linear motor car		
		8th	2nd semester mid-term exam				
	4th Quarter	9th	Return and commentary of exam answers Liquid crystal material and Li-ion battery		LCD and battery		
		10th	Basics of magnetic materials and high magnetic permeability materials		Magnetic material and BH curve		
		11th	Permanent magnet material		Magnetic material and BH curve		
		12th	Manufacturing method of semiconductor material		Silicon purity		
		13th	How to make growth transistors and MOSFET		Bipolar transistor and Nunipolar transistor		
		14th	Compound semiconductors and lasers		Laser ossillation conditions		

		15th	(2nd semester final exam)				
		16th	Return and commentary of exam answers				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	80	0	0	0	20	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	80	0	0	0	20	0	100
Cross Area Proficiency	0	0	0	0	0	0	0