

Tsuyama College		Year	2021		Course Title	Introduction to Electricity and Magnetism	
Course Information							
Course Code		0060		Course Category		General / Compulsory	
Class Format		Lecture		Credits		School Credit: 1	
Department		Department of Integrated Science and Technology Advanced Science Program		Student Grade		3rd	
Term		First Semester		Classes per Week		2	
Textbook and/or Teaching Materials		Textbooks : "Denki kiso jo" (Tokyo denki daigaku shuppan), Reference books : "Koka no butsurei denjikigaku" (Baifukan)					
Instructor		HARADA Kanji,OKE Shinichiro,MINATOHARA Tetsuya,SHIMADA Takao					
Course Objectives							
Learning purposes : To understand the basic content of Electromagnetism.							
Course Objectives : 1. To be able to explain the basics of Electromagnetism. 2. To be able to perform basic calculations of Electromagnetism.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	The student can explain the basics of electromagnetism.		The student can explain some particularly basics of electromagnetism.		The student be able to briefly explain some particularly basics of electromagnetism.		The student cannot explain the basics of electromagnetism.
Achievement 2	Students can perform basic calculations on electromagnetism		Students can perform some particularly basic calculations on electromagnetism		Students can perform basic simple calculations on electromagnetism		Students cannot perform basic calculations on electromagnetism
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : General Field of learning : Common foundation subjects for all majors Required, Elective, etc. : Must complete subjects Foundational academic disciplines : Engineering / Electrical and electronic engineering and related fields Relationship with Educational Objectives : This class is equivalent to "(2) Acquire basic science and technical knowledge". Relationship with JABEE programs : The main goals of learning / education in this class is "A-1". Course outline : This class covers the basic contents of electromagnetism with exercises.						
Style	Course method : This class will be offered in the first semester. Grade evaluation method : Regular exams (70%) +Reports (30%).						
Notice	Precautions on the enrollment : Students must take this class (no more than one-third of the required number of class hours missed) in order to complete the 4th year course. 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 : The textbook is the same as the one used in the Electrical and Electronic Circuits (2nd year). Foundational subjects :Introduction to Science and Engineering (1st year), Physics I (1st), II (2nd), Electrical and Electronic Circuits (2nd) Related subjects : Condensed Matter Physics (4th year).						
Characteristics of Class / Division in Learning							
☒ Active Learning		☒ Aided by ICT		☒ Applicable to Remote Class		☐ Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
1st Semester r	1st Quarter	1st	Guidance, vector analysis		Be able to calculate vectors used in electromagnetism.		
		2nd	Electric charge, Coulomb's law		Be able to use Coulomb's law to find the force acting on a charge.		
		3rd	Lines of electric force and electric fields		Be able to calculate the electric field due to electric charge.		
		4th	Potential, potential difference		Be able to calculate potential and potential difference.		
		5th	Electric flux, electric flux density		Be able to calculate Electric flux, electric flux density.		
		6th	Capacitor		Be able to calculate the capacitance of parallel plate capacitors. Be able to calculate the capacitance of a series-parallel circuit.		

		7th	Gauss's law	Be able to calculate the metal sphere problem using Gauss's law.
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Return and commentary of exam answers	
		10th	Magnetic charge, magnetic Coulomb force, magnetic field	Be able to calculate the force acting on a magnetic charge and the magnetic field created by the charge.
		11th	Magnetic flux, magnetic flux density, current and magnetic field	Be able to calculate magnetic flux and magnetic flux density. Be able to calculate the magnetic field created by an electric current.
		12th	Magnetic body, electromagnetic force	Be able to explain magnetic materials. Be able to calculate the electromagnetic force using Fleming's left hand rule.
		13th	Faraday's law, electromotive force	Be able to explain Faraday's law. Be able to calculate electromotive force using Fleming's right-hand rule.
		14th	Inductance, magnetic energy	Be able to calculate the inductance and magnetic energy of the coil.
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Self evaluation	Reports	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	70	0	0	0	30	0	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0