

Tsuyama College		Year	2023		Course Title	Electronic Circuits
Course Information						
Course Code	0005		Course Category	Specialized / Compulsory		
Class Format	Lecture		Credits	School Credit: 2		
Department	Department of Computer and Information Engineering		Student Grade	4th		
Term	Year-round		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks : Shigetaka Takagi and Kenji Suzuki, "Introduction to electronic circuits" written in Japanese (Jikkyo Shuppan)					
Instructor	MIYASHITA Takuya					
Course Objectives						
Learning purposes : By understanding the basic concept of electronic circuits, students will acquire basic design skills related to electronic circuits. In addition, cultivate the basic ability of hardware design of various electronic devices and IT devices.						
Course Objectives : 1. Understand how various passive and active elements (semiconductor elements) are used in electronic circuits. 2. Understand the basic operation of analog electronic circuits. 3. Understand how electronic circuits are used in various electronic devices.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Explain how various passive and active elements are used in electronic circuits by showing analysis of specific examples.	Explain how various passive and active elements are used in electronic circuits by applying them.	Explain the basics of how various passive and active elements are used in electronic circuits.	It is not possible to explain how various passive and active elements are used in electronic circuits.		
Achievement 2	Explain the basic operation of analog electronic circuits, including numerical analysis, by listing specific circuits.	Explain the basic operation of analog electronic circuits by citing specific circuits.	Explain the basic operation of specified circuits for analog electronic circuits.	It is not possible to explain the basic operation of analog electronic circuits.		
Achievement 3	Quantitatively explain how electronic circuits are used in various electronic devices by giving concrete examples.	Explain qualitatively how electronic circuits are used in various electronic devices by giving concrete examples.	Explain the basics of how electronic circuits are used in various electronic devices by giving concrete examples.	It is not possible to explain how electronic circuits are used in various electronic devices.		
Assigned Department Objectives						
Teaching Method						
Outline	* Relationship with business: In this subject, a faculty member who was in charge of semiconductor development and manufacturing technology at a company acquired basic design skills related to electronic circuits by utilizing his experience and understanding the basic concept of electronic circuits. In addition, the lessons are conducted in a lecture format for the purpose of cultivating the basic abilities of hardware design of various electronic devices and IT devices. General or Specialized : Specialized Field of learning : Electrical / electronic / control Required, Elective, etc. : Must complete subjects Foundational academic disciplines : Engineering / Electrical and Electronic Engineering and Related Fields / Electronic Devices and Electronic Equipment Related 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 "(B)". Course outline : For the purpose of acquiring basic knowledge of electronic circuits, students will learn how to express electrical signals, passive elements and semiconductor elements and their characteristics, analog, digital circuits, transistor amplifier circuits, etc.					
Style	Course method : It is a class of 2 credit hours per week. Understand the element characteristics required for electronic circuits and the configuration of electronic circuits, focusing on the exercises of the tasks assigned to the students. Grade evaluation method : Regular exams (Equivalent evaluation of each examination at the middle and final of the term) are evaluated by the total of the average score (70%) of the two times and the evaluation score (30%) of the exercise. In principle, no re-exams will be conducted. However, the re-exams may be conducted only when it is judged that the credits cannot be properly concluded based on the results of the regular exams, and the year-end grades may be corrected based on the results.					

Notice	Precautions on the enrollment : Since knowledge of electric circuits is used, understanding of lectures will not progress if the understanding is insufficient. Students must take this class (no more than one-fifth of the required number of class hours missed) in order to complete the 4th year course.
	Course advice : It is related to other subjects such as Electrical Circuits System (4th year), so study well.
	Foundational subjects : Electrical and Electronic Circuits (2nd year)
	Related subjects : Electrical Circuits System (4th year)
	Attendance advice : Work on the concept of new technical terms and learn the way of thinking in this field. Those who are late for attendance confirmation before the class starts will be treated as late. Late arrivals are limited to half of the first period of class time, after which the period will be absent. Treat the second period in the same way. Liaison Faculty is Hitoshi Sori, Communication and Information System Program

Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
--	---------------------------------------	---	--

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance Electronic circuits and circuit elements	Explain the goals of the lesson and the outline of the circuit elements used.
		2nd	Transistor amplifier circuit	Explain the configuration and features of the transistor amplifier circuit.
		3rd	Small signal amplifier circuit by transistor	Explain the configuration and characteristics of a small signal amplifier circuit using transistors.
		4th	Design of small signal amplifier circuit by transistor	It is possible to calculate the values and characteristics of components for small signal amplifier circuits using transistors.
		5th	Small signal amplifier circuit by FET	Explain the configuration and characteristics of a small signal amplifier circuit using FETs.
		6th	Negative feedback amplifier circuit	Explain the configuration and features of the negative feedback amplifier circuit.
		7th	Differential amplifier circuit and operational amplifier	Explain the configuration and features of differential amplifier circuits and operational amplifiers.
		8th	(1st semester mid-term exam)	
	2nd Quarter	9th	Return and commentary of exam answers Power amplifier circuit	Explain the configuration and features of the power amplifier circuit.
		10th	High frequency amplifier circuit	Explain the configuration and features of high-frequency amplifier circuits.
		11th	Oscillator circuit	Explain the configuration and features of the oscillator circuit.
		12th	Modulation circuit and demodulation circuit	Explain the configuration and features of the modulation circuit and demodulation circuit.
		13th	Control type power supply circuit	Explain the configuration and features of the control type power supply circuit.
		14th	Switching power supply circuit	Explain the configuration and features of the switching power supply circuit.
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers	Make sure you understand the contents up to the final exam.
2nd Semester	3rd Quarter	1st		
		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	Other	Total
--	-------------	--------------	-------------------------------------	----------	-----------	-------	-------

Subtotal	70	30	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	30	0	0	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0