

Tsuyama College		Year	2021		Course Title	Electrical and Electronic Systems
Course Information						
Course Code	0132		Course Category	Specialized / Compulsory		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Department of Integrated Science and Technology Advanced Science Program		Student Grade	5th		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks :Distribute the required prints , Reference books : "Ministry of Economy, Trade and Industry Roadmap: http://www.meti.go.jp/main/policy.html ", "US Department of Energy: http://energy.gov/eere/ssl/technology_roadmaps "					
Instructor	KOBAYASHI Toshiro					
Course Objectives						
Learning purposes : The goal is to acquire basic and applied technologies in the field of electrical and electronic systems, and to foster cross-sectoral fusion capabilities.						
Course Objectives : 1. To understand the current situation in the field of electrical and electronic systems and explain issues. 2. Propose solutions to problems in the field of electrical and electronic systems. 3. To be able to the proposed solution can be improved as a group by giving feedback from the outside.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	• A concrete example of R & D trends in environmental energy systems such as photovoltaic power generation can be explained in general, and solutions can be proposed by oneself.	• Explains specific examples of R & D trends in environmental energy systems such as photovoltaic power generation.	• Partially explain specific examples of R & D trends in environmental energy systems such as photovoltaic power generation.	• Hardly explain specific examples of R & D trends in environmental energy systems such as solar power generation.		
Achievement 2	• Explain specific examples of R & D trends in electronics systems such as robot control circuit technology, and propose solutions by yourself.	• Explain specific examples of R & D trends in electronics systems such as robot control circuit technology.	• Partially explain specific examples of R & D trends in electronics systems such as robot control circuit technology.	• Difficult to explain concrete examples of R & D trends in electronics systems such as robot control circuit technology.		
Achievement 3	• Specific examples of research and development trends in environmental energy systems such as photovoltaic power generation will be explained in group work, and solutions to problems will be summarized as group opinions. • Specific examples of R & D trends in electronics systems such as robot control circuit technology will be explained in group work, and solutions to problems will be summarized as group opinions.	• Specific examples of R & D trends in environmental energy systems such as photovoltaic power generation can be explained in group work, and solutions to problems can be improved by incorporating the opinions of members. • Group work can be used to explain specific examples of R & D trends in electronics systems such as robot control circuit technology, and solutions to problems can be improved by incorporating the opinions of members.	• Group work can be used to partially explain and improve specific examples of R & D trends in environmental energy systems such as photovoltaic power generation. • Group work can be used to partially explain and improve specific examples of R & D trends in electronics systems such as robot control circuit technology.	• Group work cannot be used to explain and improve specific examples of R & D trends in environmental energy systems such as photovoltaic power generation. • Group work cannot be used to explain and improve specific examples of R & D trends in electronics systems such as robot control circuit technology.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Fusion subjects / others Foundational academic disciplines : Engineering/Electrical and electronic system 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 "A1" and "D-3". Course outline : Students who specialize in advanced science, machinery, and information receive lectures on the forefront of the field of electrical and electronic systems, create their own problems and solutions, and then discuss and propose problem solutions in groups. By preparing a report, students will acquire basic and applied technologies in the field of electrical and electronic systems, and foster cross-sectoral fusion capabilities.					

Style	Course method : From the students' graduation research, themes presented by the instructor in charge, etc., themes are set for each group, and the contents are delved into, and surveys, examinations, proposals for problem-solving methods, presentations, and reports are created. Confirm the degree of understanding and ingenuity by submitting theme presentations, interim debriefing sessions, final debriefing sessions, and reports. Grade evaluation method : Equally evaluate the results of individual reports (8 times) and group reports (2 times) (report 90%, mutual evaluation 10%). Those with poor grades may be given additional tasks and evaluated comprehensively.
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Course advice : This course is a fusion course, and you will experience the process of understanding the knowledge related to electrical and electronic systems and proposing cross-disciplinary problem-solving methods in addition to your own specialized field. It is indispensable for the participants to prepare and review and tackle the tasks voluntarily and positively. Foundational subjects : Electrical and electronic engineering and related fields Related subjects : Introduction to Interdisciplinary Science and Technology (1st year), Cross-system Exercise I (3rd), Cross-system Exercise II (4th) Attendance advice : It is necessary to search the literature by yourself based on the lectures on the latest technological trends in the field of electrical and electronic systems, and at the stage of summarizing, teamwork ability while sharing roles, consulting and instructing each other. It is important to have an attitude toward training. Check for late arrivals and absenteeism at the start time of each time period. Significant late arrivals will be accumulated and will be absent. If you decide that it will interfere with other people's attendance, you may be asked to leave.

Characteristics of Class / Division in Learning

☒ Active Learning	☐ Aided by ICT	☒ Applicable to Remote Class	☐ Instructor Professionally Experienced
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Required subjects

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance	Understand the contents of the fusion courses and be able to organize the annual schedule by yourself.
		2nd	● R & D trends in photovoltaic power generation technology (lecture)	Explain the current status and future issues of photovoltaic power generation technology. (Creating a personal report)
		3rd	● R & D trends in electric vehicle technology (lecture)	Explain the current status and future issues of electric vehicle technology. (Creating a personal report)
		4th	● R & D trends in LED light source technology (lecture)	Explain the current status and future issues of LED light source technology. (Creating a personal report)
		5th	● R & D trends in linear motors and superconducting technology (lecture)	Explain the current status and future issues of linear motor and superconducting technology. (Creating a personal report)
		6th	● Group work I Summary of current status and issues of electrical and electronic system related technologies (discussion, survey, examination)	The current status and issues of electrical and electronic system related technologies can be summarized as a group. (Create group report)
		7th	● Group work I Summary of current status and issues of electrical and electronic system related technologies (discussion, proposal)	New proposals for electrical and electronic system related technologies can be summarized in a group. (Create group report)
		8th	1st semester mid-term exam ● Report guidance day Examination of issues (examination of issue-solving methods)	If you have any questions, talk with the faculty members in your field of specialization and the faculty members in charge to improve the level of the report.
	2nd Quarter	9th	● R & D trends in robot control circuit technology (lecture)	Explain the current status and future issues of robot control technology. (Creating a personal report)
		10th	● R & D trends in communication technology (lecture)	Explain the current status of communication technology and future issues. (Creating a personal report)
		11th	● R & D trends in quantum computer technology (lecture)	Explain the current status and future issues of quantum computers. (Creating a personal report)
		12th	● Research trends on global technological progress (lecture)	Explain the current status and future issues of research on global technological progress. (Creating a personal report)
		13th	● Group Work II Summary of current status and issues of electrical and electronic system related technologies (discussion, survey, examination)	The current status and issues of electrical and electronic system related technologies can be summarized as a group. (Create group report)
		14th	● Group Work II Summary of current status and issues of electrical and electronic system related technologies (discussion, proposal)	New proposals for electrical and electronic system related technologies can be put together as a group. (Create group report)
		15th	(1st semester final exam)	

		16th	● Report guidance day Examination of issues (examination of issue-solving methods)	If you have any questions, talk with the faculty members in your field of specialization and the faculty members in charge to improve the level of the report.
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Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	0	0	10	0	90	0	100
Basic Proficiency	0	0	0	0	60	0	60
Specialized Proficiency	0	0	0	0	30	0	30
Cross Area Proficiency	0	0	10	0	0	0	10