Tsuyama College		Year	2021		Course Title	Experimental Practice for Science and Engineering

Course Information

Course Code	0015		Course Category	Specialized / Compulsory
Class Format	Experiment		Credits	School Credit: 2
Department	Department of Integrated Science and Technology Communication and Informations System Program		Student Grade	1st
Term	Year-round		Classes per Week	2
Textbook and/or Teaching Materials	Follow the instructions of each person in charge			
Instructor	TAKAGI Kenji,CHO Feifei,NISHIO Kimihiro,YABUKI Noboru			

Course Objectives

Learning purposes :
The students take four programs of Experimental Practice to acquire basic skills in this area. In addition, they will make decisions on program selection when advancing to the second grade, taking into consideration their own learning objectives and the skills they want to acquire.

Course Objectives :
1. To understand the basic skills (in Mathematics, Measurement Technology, Programming) necessary for learning engineering and science.
2. To clarify the desired program when advancing to the second grade.

Rubric

	Excellent	Good	Acceptable	Not acceptable
Achievement 1	The student recognize and can clearly explain the basic skills (in mathematics, measurement technology, programming) necessary for studying engineering and science.	The student recognizes and can explain the basic skills (in mathematics, measurement technology, programming) necessary for studying engineering and science.	The student can recognize the basic skills (in mathematics, measurement technology, programming) necessary for studying engineering and science.	The student falls short of acceptable.
Achievement 2	The student has clearly determined and explained desired program when advancing to the second grade.	The student has determined and can explain desired program when advancing to the second grade.	The student determined desired program when advancing to the second grade.	The student falls short of acceptable.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : Specialized ・ Experimental Practice Field of learning : Experimental Practice, etc. Required, Elective, etc. : Required subjects Foundational academic disciplines : Mathematical Science / (Physics, Mathematics), Biology / Basic biology, Chemistry / (Inorganic, Organic chemistry), Informatics / Computational infrastructure / Programming, Engineering / (Electrical and Electronic Engineering, Mechanical engineering) Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area","(6)Develop problem solving abilities". Relationship with JABEE programs : The main goal of learning / education in this class is "(A)". Course outline : Students take experimental practice over 4 courses on a quarterly basis.
Style	Course method : Instructor will give guidance on first day about how to proceed with the class, including groups and plases.etc. Grade evaluation methods : The average of the exam scores is 100% of grade.
Notice	Precautions on enrollment : Students must take this class (no more than one-third of the required number of class hours missed) and earn the credit in order to complete the 1st-year course. Course advice : Students take 3 classes. Depending on the program, the inside may be further divided into 2 to 4 groups. Follow the instructions of the person in charge about the place of implementation. In charge of 7 weeks for each program. Overall guidance will be given at the beginning of the year. Foundational subjects : Science and Mathematics up to junior high school Related subjects : Experiments in Science (2nd year AC) , Mechanical System Engineering Experiments and Practice I (2nd), Electric and Electronic System Engineering Experiments and Practice I (2nd), Information System Engineering Experiments and Practice I(2nd) Attendance advice : Be sure to understand the program explanation of each teacher.

Characteristics of Class / Division in Learning

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

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Advanced Science Program : Guidance	Understand the contents of mathematics, physics, and chemical biology. Select a field from 3 contents.
		2nd	Advanced Science Program : Theme selection	Select the theme of the inquiry activity and make an implementation plan.
		3rd	Advanced Science Program : Inquiry activity	Conduct exploratory activities and verify results.
		4th	Advanced Science Program : Inquiry activity	Conduct exploratory activities and verify results.
		5th	Advanced Science Program : Inquiry activity	Conduct exploratory activities and verify results.
		6th	Advanced Science Program : Report writing	Summarize research results and create reports and presentations.
		7th	Advanced Science Program : Presentation	Understand each other's inquiry activities through research briefings.
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Mechanical Systems Program : Guidance	Understanding the contents of the experiment and understanding the precautions for safety.
		10th	Mechanical Systems Program : Lathe [Basics and foundation of operation, end face / side cutting, drilling]	Understand the basic knowledge of lathes and perform basic operations.
		11th	Mechanical Systems Program : Finishing [scoring, drilling, tapping]	Understand the basic knowledge of machine tools and perform basic operations.
		12th	Mechanical Systems Program : Finishing [scoring, cutting, sanding]	Understand the basic knowledge of machine tools and perform basic operations.
		13th	Mechanical Systems Program : Measurement (vernier caliper, micrometer)	Understand the basic knowledge of measurement.
		14th	Mechanical Systems Program : Robot arm	Can perform basic operations.
		15th	(1st semester final exam)	
		16th	Mechanical Systems Program : Report preparation and submission	Submission of final report.
2nd Semester	3rd Quarter	1st	Electric and Electronic System Program: Guidance	Understanding of Laboratory, preparation, current and voltage.
		2nd	Electric and Electronic System Program: 1.DC circuit	Understanding series and parallel circuits.
		3rd	Electric and Electronic System Program: 2.Shunt / multiplier	Understanding shunts and multipliers.
		4th	Electric and Electronic System Program: 3.Handling of testers	Understanding how to use the tester.
		5th	Electric and Electronic System Program: 4.Logic circuit	Understanding how to use logic circuits and how they work.
		6th	Electric and Electronic System Program: 5.Making a timer	Understanding the quality of soldering.
		7th	Electric and Electronic System Program: 6.Making a timer	Understanding the quality of soldering.
		8th	2nd semester mid-term exam	
	4th Quarter	9th	Information System Program: Guidance	Understanding the contents of the experiment.
		10th	Information System Program:	Completion of microcomputer kit
		11th	Information System Program:	Connection between microcomputer and personal computer, construction of program development environment, program creation, and report of execution results
		12th	Information System Program:	Program creation and execution result confirmation
		13th	Information System Program:	Program creation and execution result confirmation
		14th	Information System Program:	Program creation and execution result confirmation
		15th	(2nd semester final exam)	
		16th	Information System Program:	Report submission(program execution result report)

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual evaluation	Portfolio	Other	Total
Subtotal	0	10	10	70	10	100
Basic Proficiency	0	0	0	0	0	0
Specialized Proficiency	0	10	10	70	10	100
Cross Area Proficiency	0	0	0	0	0	0