| Tsuyama College | Year | 2021 | | Course Title | Information System Engineering Experiments |
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## Course Information

| Course Code | 0081 | | Course Category | Specialized / Compulsory |
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| Class Format | Experiment | | Credits | School Credit: 3 |
| Department | Department of Integrated Science and Technology Communication and Informations System Program | | Student Grade | 4th |
| Term | Year-round | | Classes per Week | 3 |
| Textbook and/or Teaching Materials | Textbook(s): "Information system engineering experiment," written by a teacher belonging to our college. Reference book(s): Reference book is ordered for each experiment theme in needing. | | | |
| Instructor | TERAMOTO Takayuki,KAWANAMI Hiromichi,MATSUSHIMA Yukiko,HATA Yoshikazu | | | |

## Course Objectives

Learning Purposes:
The aim of this course is to help students acquire the necessary background, basic knowledge and technique in the information system-engineering field. It also enhances the students' abilities in recognizing and solving of problems through performing experimental plans.

Course Objectives:
◎1. To explain experimental results and considerations logically.
◎2. To acquire experimental knowledge and skill, i.e., collection, analysis, processing and arrangement, for information.
◎3. To find a problem through an experimental plan and formulate solutions without help.
◎4. To resolve a problem with a restriction by utilizing hardware and software properly.

## Rubric

| | Excellent | Good | Acceptable | Not acceptable |
|---|---|---|---|---|
| Achievement 1 | The student can logically explain the reasonability and considerations in terms of experiment results. | The student can logically explain the reasonability and considerations in terms of experiment results, with through supported of others. | The student can logically understand the reasonability and considerations in terms of experiment results. | The student cannot logically understand the reasonability and considerations of experiment results. |
| Achievement 2 | The student can properly carry out collection, analysis, processing and arrangement of problems using experimental knowledge and techniques. | The student can properly carry out collection, analysis, processing and arrangement in of problems using experimental knowledge and techniques while revising slightly. | The student can properly carry out collection, analysis, processing and arrangement of problems using experimental knowledge and techniques, with help. | The student cannot properly understand collection, analysis, processing and arrangement of problems using experimental knowledge and techniques. |
| Achievement 3 | The student can find a problem through performing an experimental plan and action without help. | When a problem is pointed out by others during an experiment plan or experiment work, the student can understand the essence of problem. | When a problem is pointed out during an experiment plan or experiment work, the student can understand the problem. | When a problem occurs during an experiment plan or experiment work, the student cannot understand it. |
| Achievement 4 | The student can properly resolve a problem of with a restriction by utilizing hardware and software. | The student can properly resolve a problem, with help from others, by utilizing hardware and software. | To solve a problem, the student can, by utilizing hardware and software, relate to a solution suggested by others. | The student cannot understand a method of utilizing hardware and software to find used a solution. |

## Assigned Department Objectives

## Teaching Method

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| Outline | General or Specialized: Specialized<br><br>Field of learning: Experiment & Practice<br><br>Foundational academic disciplines:<br>  Information science, Information engineering and related fields/Calculator system, Information network.<br><br>Relationship with Educational Objectives:<br>  This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area"<br><br>Relationship with JABEE programs:<br>  The main goals of learning/education in this class are "(A) ..., A-3: ..." and also "D-2" is involved.<br><br>Course outline:<br>  The fourth grade that the acquisition of the specialized field takes root in one's studies performs the engineering experiment in four application fields. |

| | | | Course method: Students are divided into four groups and perform four experiment themes sequentially. The themes are as follows: |
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| Style | Course method:<br>Students are divided into four groups and perform four experiment themes sequentially. The themes are as follows:<br> (1) Hardware experiment (Teramoto)<br> The students design a logical circuit with a PC. Then the students assemble the circuit in a PLD (Programmable Logic Device) and actually operate it.<br> (2) Software experiment (Hata)<br> The students learn the development method using a debugger and profiler in the IDE (integrated development environment).The students understand a basic concept of object-oriented programming.<br> (3) Measurement/Control experiment (Kawanami)<br> The students create an experiment to control a signal input-output device, such as a sensor and a motor, with a PC<br> (4) Network experiment (Tanaka)<br> The students learn the communication method of using TCP/IP/Ethernet and a network design method. In addition, they actually construct a<br> communication network.<br><br>Grade evaluation method:<br> The grade is based on experiment reports (100%). All reports in the 1st half of the year and the 2nd half are evaluated equally. |
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| Notice | Precautions on enrollment:<br>This class employs a practical skill mainly. 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 4th-year course. And as this is a "class that requires study outside of class hours," students should look to the instructor for advice on what to do.<br><br>Course advice:<br>Since this class is focused on practical experiments, it is important for students to prepare for the next experiment and to review the experiment report.<br>Foundational subjects:<br>Information System Engineering Experiment Practice 1 (2nd-year).<br>Related subjects: Graduation Thesis (5th)<br>Attendance advice:<br>Experiment reports should include not only the results, but also trace the experiment progress (experiment procedure and progress along the way) The students must submit a timely report or be marked down.<br>Students must perform all assigned experiments.<br>Tardy: Tardiness is an absence after 10 minutes.<br>Attendance advice: |

## Characteristics of Class / Division in Learning

| ☐ Active Learning | ☑ Aided by ICT | ☐ Applicable to Remote Class | ☐ Instructor Professionally Experienced |
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R e q u i r e d   s u b j e c t s

## Course Plan

| | | | Theme | Goals |
|---|---|---|---|---|
| 1st Semester | 1st Quarter | 1st | (After this the 1st group is shown as a typical example in four groups.)<br>Guidance 1 : Outline of Measurement & Control Experiment | |
| | | 2nd | Experiment 1-1 : Learning of development environment using Arduino, LED control | The student will be able to understand micro board (Arduino), electronic circuit, a flow of program development, and make simple controller circuit. |
| | | 3rd | Experiment 1-2 : Control of full color LED | The student will be able to control basic output signal. |
| | | 4th | Experiment 1-3 : Control of Piezoelectric speaker and analog input-signal measurement | The student will be able to handle both basic analog input signal and output signal. |
| | | 5th | Experiment 1-4 : Measurement with temperature sensor and Control of servomotor | The student will be able to use temperature sensor and servomotor. |
| | | 6th | Experiment 1-5 : Production of fan with air volume adjustment function | The student will be able to understand sketching of the practical application and make a circuit. |
| | | 7th | Experiment 1-6 : Production and improvement of baseball-game | The student will be able to understand the practical sketch and circuit, and to apply to various aspects. |
| | | 8th | Instruction of report writing | |
| | 2nd Quarter | 9th | Guidance 2 : Outline of Network Experiment | (* For revising contents, the following is in consideration now.) |
| | | 10th | Experiment 2-1 : | |
| | | 11th | Experiment 2-2 : | |
| | | 12th | Experiment 2-3 : | |
| | | 13th | Experiment 2-4 : | |
| | | 14th | Experiment 2-5 : | |
| | | 15th | Experiment 2-6 : | |
| | | 16th | Instruction of report writing | |
| 2nd Semester | 3rd Quarter | 1st | Guidance 3 : Outline of Haredware Experiment | |
| | | 2nd | Experiment 3-1 : | |
| | | 3rd | Experiment 3-2 : | |
| | | 4th | Experiment 3-3 : | |
| | | 5th | Experiment 3-4 : | |
| | | 6th | Experiment 3-5 : | |
| | | 7th | Experiment 3-6 : | |

| | | 8th | Instruction of report writing | |
|---|---|---|---|---|
| | 4th Quarter | 9th | Guidance 4 : Outline of Software Experiment | |
| | | 10th | Experiment 4-1 : | |
| | | 11th | Experiment 4-2 : | |
| | | 12th | Experiment 4-3 : | |
| | | 13th | Experiment 4-4 : | |
| | | 14th | Experiment 4-5 : | |
| | | 15th | Experiment 4-6 : | |
| | | 16th | Instruction of report writing | |

## Evaluation Method and Weight (%)

| | Examination | Presentation | Mutual Evaluations between students | Behavior | Portfolio | Other | Total |
|---|---|---|---|---|---|---|---|
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Basic Proficiency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Specialized Proficiency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cross Area Proficiency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |