110-1 Full Curriculum of Da-Yeh University

Information			
Title	Principles and Applications of Sensors	Serial No./ID	1679 /ENI3007
Required/Credit	Optinal /3	Time/Place	(Thu)567 /H708
Language	Chinese	Grade Type	Number
Lecturer /Full- or Part-time	Tsai Huan-Liang /Full-time	Graduate Class	Non-graduating Class
School System /Dept /Class, Grade	Bachelor /College of Engineering /Class 1, Grade 3		
Office Hour / Place	(Mon) 16:20~17:10, (Tue) 08:10~09:00, (Wed) 08:10~09:00, (Thu) 11:10~12:00 / H715		
Lecturer	n.a.		

Introduction

This course introduces the characteristics of sensors. The working theory and application of several types of sensors will be presented as examples for the better understanding of students. Finally, the students need to implement a system by using sensors and Arduino to enhance the capability of applying the sensors.

Outline

1.Sensing principles
2.Introduction of different sensors
3.Implementation of sensor circuits
4.Implementation of sensor applications

Prerequisite

Programming

The Relationship Between Courses and Departmental Core Competencies and Basic Skills

- Ability to apply knowledge of mathematics, science, and engineering.
  Knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning.
- Ability to design and conduct experiments, as well as to analyze and interpret data.
- Ability to apply techniques, skills, and modern tools necessary for engineering practice.
  Ability to design an engineering system, component, or process.
- Ability to manage project (including budgeting), communicate effectively, work in multi-disciplinary environment, and function on teams.
  Ability to identify, formulate, research literature and analyses complex engineering problems reaching substantial conclusions.
  Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice,

and a sense of respect for diversity.

Teaching Plan						
Core Capability	Weight(%)【A】	Ability index(Performance Indicators)	Teaching Methods	Assessment and Weight	Core Competency Learning Outcomes【B】	Final Exam Grades【C=B*A】
Ability to apply knowledge of mathematics, science, and engineering.	30	Ability to apply knowledge of mathematics, science, and engineering.	Student Presentation Practical Operation (Experiment, Machine Operation Lecturing Special Report	Oral Report: 10% Assessment on Teamwork: 10% Product Manufacturing: 20% Course Participation: 20% Midterm Exam: 30% Written Report: 10%	Total: 100	30
Ability to design and conduct experiments, as well as to analyze and interpret data.	30	Ability to design and conduct experiments, as well as to analyze and interpret data.	Student Presentation Practical Operation (Experiment, Machine Operation Lecturing Special Report	Oral Report: 10% Assessment on Teamwork: 10% Product Manufacturing: 20% Course Participation: 20% Midterm Exam: 30% Written Report: 10%	Total: 100	30
Ability to apply techniques, skills, and modern tools necessary for engineering practice.	30	Ability to apply techniques, skills, and modern tools necessary for engineering practice.	Lecturing Practical Operation (Experiment, Machine Operation Student Presentation Special Report	Midterm Exam: 30% Course Participation: 20% Product Manufacturing: 20% Assessment on Teamwork: 10% Oral Report: 10% Written Report: 10%	Total: 100	30

Ability to manage project (including budgeting), communicate effectively, work in multi-disciplinary environment, and function on teams.	10	Ability to manage project (including budgeting), communicate effectively, work in multi-disciplinary environment, and function on teams.	Lecturing Practical Operation (Experiment, Machine Operation Student Presentation Special Report	Midterm Exam: 30% Course Participation: 20% Product Manufacturing: 20% Assessment on Teamwork: 10% Oral Report: 10% Written Report: 10%	Total: 100	10

Grade Auditing

Midterm Exam: 30%
Product Manufacturing: 20%
Course Participation: 20%
Written Report: 10%
Assessment on Teamwork: 10%
Oral Report: 10%

Book Type (Respect intellectual property rights. Please use official textbooks and do not illegally photocopy others' works.)

Book Type	Book name	Author
Textbook	感測器原理與應用實習	盧明智、陳政傳

Lesson Plan

Weeks	Content	Teaching Methods
1	preparation & Intellectual Property Protection (use legitimate textbooks only) & Traffic safety Propaganda	Lecturing、 Practical Operation (Experiment, Machine Operation
2	sensor switches	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
3	Light sensor	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
4	Temperature and RH	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report

5	Temperature and RH	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
6	Magnetic sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
7	Sonic and vibration sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
8	Sonic and vibration sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
9	Report for Mid Exam	Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
10	gas sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
11	gas sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
12	position sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
13	position sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
14	rotation sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
15	rotation sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
16	mass and pressure sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report

17	water level sensors	Lecturing、 Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report
18	Final Exam	Practical Operation (Experiment, Machine Operation、 Student Presentation、 Special Report