TKE213105

Electrical Engineering Junior Projects

Proyek Junior Teknik Elektro

BASIC INFORMATION

Course Credit	2 / 100 minutes per Week
Course Type	Required
Course Classification	Engineering Topics
Prerequisites	All Basic Sciences Courses

STUDENT AND LEARNING OUTCOMES

Covered Student Outcomes

Development of Engineering Solution (KP.2)

Engineering Design (KP.3)

Data and Experiments (KP.4)

Modern Tools Utilization (SK.1)

Learning Outcomes

LO1 Students are able to solve simple electrical engineering problems.

LO2 Students are able to design simple electrical engineering solutions.

LO3 Students are able to use modern tools and IT in their works.

LO4 Students are able to design and perform complete simulation.

LO5 Students are able to perform experiments to acquire data.

COURSE DESCRIPTION

In this project, a series of assignments in the laboratories are compulsory for all students. In total we have 3 mandatory hands on (Oscilloscope and measuring devices tutorial, PCB board soldering, Matlab's hands on), 15 mandatory modules, and 10 elective modules and hands on. In order to access the final assignment, i.e., the projects itself, students have to complete at least 20 (18 compulsory + 2 electives) assignments. The hands on and modules will be running throughout semester 3 and 4 where the students are required to complete them within the specified period. Once completed, groups of students (at most 6) can start the projects. The theme of the projects might change annually. Some samples of the projects are:

1. A boom bass amazing amplifier for your very low frequency voice
2. Energy sensors for wind/microhidro/other kind of renewable energy
3. Digital filter and implementation in a digital signal processor (DSP) device
4. Etc.

TOPICS

Compulsory courses

1. Introduction to engineering design
2. Project management
3. Impact of engineering design

Compulsory Labskills

1. PCB board soldering
2. Matlab/Scilab essential
3. How to use Oscilloscope, digital and analog meters

Lab Sessions

1. Electric circuits (DC)
2. Digital Systems
3. Numerical computation
4. Electric Circuit (AC)
5. Fundamental of Telecommunication
6. Fundamental of Electronics
7. Microprocessors
8. Signal and Systems
9. Sensors and Instrumentation
10. Digital Signal Processing in a hardware

Independent Project

At the end of this course an independent project is assigned in group.

REFERENCES

[1] J. Abarca, A.J. Bedard, D.W. Carlson, L.E. Carlson, J. Hertzberg, B. Louie, J. Milford, R. Reitsma, T. L.Schwartz and J.F. Sullivan, "Introductory Engineering Design: A Projects-Based Approach," Third Edition.

[2] Alan D. Wilcox, Engineering Design for Electrical Engineers, 1st Edition, Pearson