COLLEGE OF ENGINEERING
Department OF Electrical Engineering

EngE490 - Senior Project (I)
Proposal Procedure

Proposals can be submitted by students, faculty or industry. The deadline for submission is First of September, and First of April. Each project will be completed under the supervision of one or more department or college staff members with expertise in the project area. Each student team will normally consist of Three to Four Department or college engineering seniors.

Each project must meet the following criteria:

1. Project can be completed during TWO semesters (ONE academic year.)
2. Project must meet ABET design criteria:
   a) Open ended
   b) Non-unique solutions
   c) Student decisions required
   d) Involve advanced engineering analysis
   e) Design configuration decisions required
   f) Visibility studies and market needs

The main emphasis of the project is design. If construction is involved it must not override the engineering design aspects of the project.

Each proposal should be outlined as listed below:

A. Proposer's name, address, phone number and affiliation.
B. Choice of faculty advisor if known.
C. Number of students desired and student design team choice if known.
D. Type of analysis that project may involve such as (Department specialties)…….
   ……..
E. State tentative project name followed by a description of the project not more than one page in length.
F. If the project is from industry please state what your company is willing to donate to the project to offset student travel, duplication expenses, etc. Estimated Budget around 5000 SR or budget accepted by the university

The proposals will be reviewed by the department and confirmed by the Advisory Board. Students will be assigned to selected projects early at 10th September and April.

Please submit proposals with formal attached Form by Email to:

College Coordinator of Capstone Design
Dr. Refaat Khater
ref_khater@yahoo.co.uk,
Department Coordinator of Capstone Design
Name:……
Email: …….

COLLEGE OF ENGINE ERING
Department OF Electrical Engineering
EngE490 – Senior Project (I)
Proposal Format

Academic year	**1440 – 1441 / 2019 – 2020**
Semesters	**Fall / Spring**
Academic Level	**Nine / Ten**
Project Title	**Design of Automatic Control Elevator based on PLC**
Supervisor	**Dr. Sabeur MASMOUDI**
Number of Student Team	**5**

1- Introduction & Background

The field of automation had a notable impact in a wide range of industries beyond manufacturing. To survive in the competitive world, company should use the industrial automation for all control systems and information technologies based on Programming Logic Controller (PLC). PLC is used to reduce the need for human intervention and to increase the production with reduction in the cost and safety operation. It plays also an important role and acts as a major function in automation industry. It acts a major function in the automation field which tends to reduce the complexity, increases safety and cost efficient. One applications of automation process based on PLC is elevator, where the cabin is left up or let down.

If human effort is used in this field it become so difficult to perform this long and continuous process and so it is being substituted by automation process which the tasks with safety and efficiency. As mentioned above, this project is also an application where the automation process is used to control the design and implementation of an elevator based on PLC.

We will divide the project into two parts: Hardware and software. For the hardware part, we will use several automation components such as: sensors, DC motor and PLC for control the elevator process moving along three different floors. In each floor, we will use two type of sensors: for detecting the presence of cabin and to sense the opening or closing door.

For the software part, we will develop a ladder logic program and its equivalent Sequential Functional Chart to control the moving of cabin for three floors by using S7-Simatic Manager Automation in order to design a prototype of project.

This project will be divide into three chapters where the first one explains both the hardware and the software configuration of the PLC. The second chapter describes the details of the used tools and components based on PLC. The last chapter gives a functional description of the prototype with all details of implementation.

2- Problem Statement and Objective (ABET – 3e)

Problems are classified as follows: i) Specifications of the desired automatic control system ii) Technological choices for the proposed industrial solutions iii) Programs and simulations used for the suggested process iv) Inputs and outputs wiring connections v) Design and implementation of prototype. From the above problems the students identify first the specification of the automated elevator and the technological choice used into PLC input and output interfaces. Then, they establish the corresponding Grafcet and the equivalent LADDER program specific for the desired process. Finally, the students should be 1) creating a final design of the

proposed automated process with implementation into PLC and 2) solving the engineering problems appearing during the project.

3- Problem justification and Outcomes (ABET - 3e)

In this project the students justified the engineering problems and formulate how to solve these problems. The whole sections are controlled by the PLC S7-313C that represent an electronic Digital device which uses programmable memory to store commands and performs certain logical tasks in a row (sequence) Time so as to control Machinery and industrial processes in factories.

Programmable Logic Controllers (PLCs), also referred to as programmable controllers, are in the computer family. They are used in commercial and industrial applications. A PLC monitors inputs, makes decisions based on its program, and controls outputs to automate a process or machine.

4- Literature Review (ABET – 3j)

i) PLC Book ii) ProcesSim Help iii) Digital and Analog sensors iv) Automating Manufacturing Engineering Systems.

5- Problem Constraints (ABET - 3c)

Problem constraints are: i) Specification of system ii) Technological choices iii) Drawing the corresponding Grafcet iv) Programming and implementation into PLC v) Creating a final design.

6- Design Approach and Methodology (ABET - 3a, 3b, 3e, 3k)

i) Knowledge the advantages of automated control systems and solving engineering problems.
ii) Using Sequential Function Charts to program the PLC.
iii) Wiring connections of PLC using input and output interfaces.
iv) Creating a new design of automated elevator using PLC.

7- Tasks and Time Schedule

(Level: 9, Second Term, 1439)

Task No.	Task Name	Duration (Weeks)
1	Data collections	3
2	Specification of system	3
3	Technological choice	3
4	Sequential Function Charts (SFCs)	3
5	Report & seminar	3

(Level: 10, First Term,1440)

Task No.	Task Name	Duration (Weeks)
1	Revision of the tasks on first semester	2
2	Prepare the specific programs of process	2
3	Prepare the wiring interfaces of PLC	2
4	Establish a simulation of the desired automation system using ProcesSim	2
5	Report & seminar	2
6	Prepare a design	3
7	Discussion, conclusion and final report	2

8- Budget & Expenditures Sheet

Items	Description	Estimated Price
1	PLC- S7 313C	exist
2	Incremental Encoder	1 000
3	Floor and Cabin sensors	1 000

4	Display 7-segment	500

Senior Project -Presentation

EngE490 Case Study Presentations

I have invited Guest lecturers and students to provide you with actual projects or situations for your review.

- Review your notes and presentation slides
- Study the information
- Use what you have learned in project class to identify various issues/topics of interest.
- Working in your teams, select one of the Guest Lecturer projects for review.
- Please identify why you have selected the guest lecture or video for case study review.
- Please identify the Engineering Challenges for the Case Study.
- Review and discuss the project within the framework of the course topics including:
  - Need Identification and Problem Definition
  - Project Planning
  - Technological Innovation
  - Concept Generation and Evaluation
  - Legal and Ethical Issues

Your Case Study review should be between 8 to 10 minutes. Because of time constraints, I may cut off teams in excess of 10 minutes. Therefore please plan your time wisely.
You should prepare your presentation with PowerPoint and have a copy on a USB memory stick. Please do not show up with a floppy disk and expect to load into the computer. Please be prepared to present at your selected time. If you have a significant delay in setting up that effect the timing of other presentation, your score will be deducted.
A good rule of thumb is one slide per minute. Therefore, I recommend that you limit to more than 12 slides.

Recommended Presentation Outline

- Title Slide: Case Study Project,
- Team Members,
- Date
- Agenda – organization of the presentation materials
- Case Study Selection – Why you have chosen or selected this project for review
- Background – Provide summary or overview of the case study project
- Engineering or Technical Challenges – Identify the challenges as presented
- Case Study Review – Identify and discuss various course topics as they relate to the case study. You should be able to describe the Design Process or Methodology for your case.
- Summary/Conclusions, what is your outcomes, visibility, marketing
- References/Acknowledgements

Your presentation will be assessed by the following criteria:

- Organization and Style of Presentation
- Case Study Review – identification of topics, significance of review

EngE490 – Senior Project

Catalog Data: *EngE490* – Senior Project. (4:6,0)
Continuous Assessment two semesters (Duration – 30 weeks)

Fall/Spring: 1440/1441

Department of: Electrical Engineering

Senior Project Sign-Up Sheet

Project Title: **Design of Automatic Control Elevator based on PLC**

Project Advisor: **Dr Sabeur MASMOUDI**_____

Team Members:

NAME	ID	MOBILE NO.	E-MAIL
خالد محمد سالم سحاري	201601496	0537468979	Khaldov19961417@gmail.com
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يحي احمد سلمان جذمي	201413447	0550509691	yaha143393@gmail.com

Please identify the everyday item that will be addressed by the design project.
Your team will also address the Case Study assignment.
Please identify a Team Leader to address communication responsibilities.
Team must have a minimum of 3 members and no more than 5 members.

Signature
(1) ……..…. (2) ……..…..…. (3) …….…… (4) …….…… (5) …….…… (6) ……...……

[This page must be signed and returned no later than the start of the 2rd Session. Students who are not comfortable signing this document should meet with the course coordinator before the third week of the semester to review the requirements as necessary.]