COLLEGE OF ENGINEERING
Department of Electrical Engineering

EngE 590 – Senior Project (I)
(Capstone Design)
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 ENGINEERING
Department of Electrical Engineering

Eng… 590 – Senior Project (I)
(Capstone Design)

Proposal Format

Academic year	1440 – 1441 - 2019 –2020
Semesters	Fall / Spring
Academic Level	Nine / Ten
Project Title	Broadband Power Line Communications for Smart Grid
Supervisor(s)	Dr. Emad Saeid
Number of Student Team	5

1- Introduction & Background

In order to achieve 2030 vision, the public and private sectors in KSA are paying significant attention to the growing smart city and smart grid industry. A number of smart city conferences are arranged in the last year in KSA such as Saudi Smart Cities 2017. Smart grid refers to the use of smart devices and information technology to control electrical grid and features (such as billing, lighting, etc.). In this project, we present the study of power line communication for smart grid.

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

The main objectives of this project as follows;
- Introduction and 2030 Vision.
- Smart Grid Concept.
- Power Line Communication (PLC) Principles.
- PLC Kits.
- Practical PLC Experiments.

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

In this project, we propose a new transceiver scheme for broadband power line communications (BPLC) that implements chaotic interleaving scheme to improve the bit error rate (BER) performance. Moreover, it increases the security of BPLC. As a real application of the proposed transceiver, we check the transmissions of images over a real PL channel. Images with high peak signal to noise ratio (PSNR) are received and the proposed transceiver is shown to have a good performance over PL channels.

4- Literature Review (ABET – 3j)
- Introduction and 2030 Vision.
- Smart Grid Concept.

- Power Line Communication (PLC) Principles.
- PLC Kits.
- Practical PLC Experiments.

5- Problem Constraints (ABET - 3c)

- Students background in wireless and wire communications and programming.
- Security to protect Smart Grid.

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

- Knowledge of wireless and wire communication principles.
- Principle of Smart Grid.
- Power Line Communication (PLC) Principles.
- PLC Kits.
- Practical PLC Experiments.

7- Tasks and Time Schedule

(Level: 9, First Term, 143..)

Task No.	Task Name	Duration (Weeks)
1	Introduction and 2030 Vision.	2
2	Principle of Smart Grid.	2
3	Power Line Communication (PLC) Principles.	2
4	PLC Kits.	2
5	Practical PLC Experiments.	3

(Level: 10, Second Term,143..)

Task No.	Task Name	Duration (Weeks)
1	Hardware Connection and Assembling.	2
2	Programming and Test	2
3	Practical prototype.	2
4	Practical prototype check.	3
5	Writing the project book and seminar.	2

8- Budget & Expenditures Sheet

Items	Description	Estimated Price
1	BPLC matlab simulation	available
2	Texas Instruments' Power Line Communication Developer's Kit - V3	2700 SR
3	TP-LINK TL-WPA4220KIT ADVANCED AV500 Wi-Fi Powerline Extender Starter Kit.	200 SR

8- Visibility of the product and market needs (ABET -)

In this project, we propose a new transceiver scheme for broadband power line communications (BPLC) that implements chaotic interleaving scheme to improve the bit error rate (BER) performance. Moreover, it increases the security of BPLC. The BER performance of BPLC with proposed transceiver scheme is evaluated by computer simulations. As a real application of the proposed transceiver, we check the transmissions of images over a real PL channel. Images with high peak signal to noise ratio (PSNR) are received and the proposed transceiver is shown to have a good performance over PL channels.

Supervisors	
Name	Signatures
Dr. Emad Saeid	

Senior Project (Capstone Design) Presentation

EngM 590 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 onto 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

EngM 590 – Senior Project
(Capstone Design)

Catalog Data: *EngE 590 – Senior Project*. **(4:6,0)**
Continuous Assessment two semesters (Duration – 32 weeks)

Fall/Spring 1439/1440

Department of: Electrical Engineering

Senior Project Sign-Up Sheet

Project Title: **Web Controlled Smart Home System**

Project Advisor: **Dr. Emad S. Hassan**

	Name	ID
Team Leader	(1) عبدالرحمن عبدالعزيز عبدالرحمن الغامدي	201210227
Team Members	(2) ابراهيم عبدالباري احمد شبلي	201411966
	(3) عبدالمغيث ابراهيم احمد القاسم	201505760
	(4) عبدالعزيز حسن علي الحازمي	201600223
	(5) عبدالكريم سلمان سليمان الفيفي	201601105

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) ….…………..

[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.]