



COLLEGE OF ENGINEERING, KING KHALID UNIVERSITY

Graduation Project

Guidelines

2020-2021

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Brief: Graduation Project (Senior design Project)

Apart from academic experience gained from the university required, general education, common engineering, core and elective courses, students gain a major comprehensive engineering design experience in the course called Graduation Project (EE591). Engineering design is the process of formulating or devising a system, component, or process to meet the desired needs. It is a decision-making process in engineering design in which the math and basic sciences and other engineering sciences are applied to utilize and convert resources optimally to meet the defined objective. The basic elements of the design process are the objectives and criteria, synthesis (analysis and design), testing and assessment of experiments. Students are groomed to analyze specific problems and synthesize appropriate data into a systematic approach/method for determining engineering design solutions.

Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. The engineering design component of a curriculum must include some of the following features: development of student creativity, use of open-ended problems, development and use of design methodology, formation of design problem statements and specifications, consideration of alternative solutions, feasibility considerations, and detailed system descriptions. Further, it is essential to include a variety of realistic constraints such as economic factors, safety, reliability, aesthetics, ethics, and social impact. Courses that contain engineering design normally are taught at the upper division level of the engineering program. Some portion of this requirement must be satisfied by at least one course which is primarily design, preferably at the senior level, and draws upon previous coursework in the relevant discipline.

The graduation project course requires following chapters such as literature review, formulate project objectives, planning process, critical analysis, design; develop

reading/writing/research skills, and a follow-up to achieve the finished deliverables. Many of the student learning outcomes are analyzed on the basis of graduation project. In the selection process of the project, faculty announces the projects as per his expertise and students will choose their project as per their interest, and the main advisor in the area will provide the structure, the process, the deadlines, the criteria, the feedback, and the support to promote success. The B.Sc. Electrical Engineering graduation project committee is responsible for formulating the schemes of students' assignment to different projects, guiding the assessment tools of the students, and organizing the final presentation of the students. The time allotted for Graduation Project is two semesters.

General Guidelines

1. Introduction

The guideline is intended to serve as a reference for both students and supervisors on all issues related to graduation projects from project inception up to completion. It presents general guidelines for the completion of a graduation project in the department of Electrical Engineering at King Khalid University. This guide, however, will not cover all the difficulties a student may encounter during the project, therefore, it is extremely important that the students keep in regular contact with their supervisors so that problems are detected and addressed as soon as possible.

2. Eligibility

In order to be eligible to register for the graduation project module, a student must have no more than 40 credits remaining (inclusive of the 3 credits for the graduation project) to complete the B.Sc program. This means that a student should have no more than 37 credits of coursework in order to register for the graduation project.

3. Graduation Project Modules

The graduation project is divided between two levels taken in two separate semesters: semester 1 and semester 2. In semester 1, project definition, literature survey, problem analysis and the required software/hardware tools are identified and procured. In semester 2, the work started in semester 1 is continued and shall cover the implementation and demonstration of the stated project objectives.

4. Graduation Project Objectives

- To create an environment for the undergraduate students to use the technical engineering knowledge and skills acquired in the other courses to solve real engineering and technical problems.
- To enhance creativity of the students in analyzing and solving engineering and technical problems in general.
- To create professional environment to promote multi-disciplinary learning and team approach to problem solving.
- To embark on lifelong learning who create and disseminate new knowledge in engineering.

- To prepare students to be successful in their industrial careers.

During the first semester (semester 1) of the project, students will work on an engineering problem that facilitates development of students' skills in:

- Project planning and management.
- Problem investigation in a specific domain including substantial background research and review of the literature.
- System analysis (hardware, software or both, as the case may be) and design.
- Identifying required resources for the project.
- Interpersonal skills including teamwork and group dynamics, oral and written communication.

During the second semester (Semester 2) of the project students will work on implementation of the project to achieve the stated project objectives, facilitating the development of students' skills in:

- Project planning and management.
- System modeling and design
- Simulation/Emulation or building prototypes
- Fault detection and troubleshooting
- Interpersonal skills including teamwork and group dynamics, oral and written communication.

5. Learning Outcomes

- An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, constructability, and sustainability
- An ability to identify, formulate, and solve engineering problems
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- a recognition of the need for and an ability to engage in lifelong learning

- The ability to function on multidisciplinary teams
- An understanding of professional and ethical responsibility
- a knowledge of contemporary issues
- An ability to communicate effectively (oral)
- An ability to communicate effectively (written)

6. Graduation Project Requirements

The senior design courses are intended to provide capstone design experience. The courses draw on the students' skills and knowledge gained from previous years of coursework in mathematics, sciences, engineering science and design. The senior design project should be sufficient in scope and technical content to demonstrate the students' technical competence in their major area of study. The successful completion of senior design project is indicative of the students' preparedness to pursue professional practice of engineering.

The following guidelines are provided in the Senior Design Projects Manual to help faculty and project sponsors identify suitable senior project topics:

- The project should emphasize design, experimentation and/or hands-on skills.
- The project should offer opportunity for creativity.
- The project should allow teamwork among seniors in one or more majors.
- The project should draw on the students' skills and knowledge gained from previous years of coursework.
- The project should incorporate engineering standards and realistic constraints that include most of the following: economic; environmental; sustainability; manufacturability; ethical; health and safety; social; and political.
- The project schedule should be limited to approximately 30 weeks
- The project should have concrete and measurable goals.

Projects involving only collection of published materials are unacceptable and projects involving classified materials should be avoided.

7. Duration of the project

The Graduation Project spans over two semesters, semester 1 lasts approximately 15 weeks, including preparation week, for group formation and project group assignments. Semester 2 lasts approximately 15 weeks; it starts immediately from the first week of the semester. Project presentations for semester 1 and semester 2 are scheduled at the end of the semester, and students are required to present their project work during these presentations. The final project presentation towards the end of semester 2 must include demonstration of project completion and achievement to stated objectives.

8. Phases of Graduation project

8.1. Project Stages

8.1.1. Group Formation

This process should take place before the semester begins. Students should inquire about group size for the graduation projects prior to the semester they are required to register project-1. Groups are formed by the Graduation Project (GP) Coordinator based on project preferences submitted by students eligible for registering for project. Typically, a group can have a maximum of 5 students. It should be ensured that a group has a good mix of CGPA, i.e. a single group cannot have all/mostly high CGPA students or all/mostly low CGPA students. Once a group formulate is formulated, it should designate a Group leader, who is responsible for contacting the Graduation Project (GP) Coordinator and filling all necessary forms. Students can make their own project proposals, subject to approval of their proposed supervisor, GP coordinator and adherence to the above CGPA rules.

8.1.2. Supervisor's areas of research

It is advisable that students, who wish to propose an idea and undertake their own idea for the project, should consult the list of research interests of available staff. This will provide a higher chance of accepting a student-initiated proposal. The list of department staff and their corresponding fields of research are available on the department website.

8.1.3. Project Ideas

Ideas for projects can either be proposed by a supervisor or a group of students. If students would like to propose a project idea, a project idea proposal form, as shown in Appendix A1 should be submitted prior to the term which they are required to register for semester 1. Supervisors may propose their ideas by filling a project-description form, as shown in Appendix A2. Project descriptions should be sent to the GP coordinator prior to the beginning of the term. All student-initiated proposals and supervisor project descriptions should be submitted to the GP coordinator by the first day of the new semester.

8.1.4. Project Approval

After the GP coordinator receives proposals (from students or supervisors), he should send a copy of the proposals to all GP Committee members. The GP Coordinator should organize a GP committee meeting during the first week of the semester to discuss project idea proposals and descriptions. The main objective of this meeting is to examine submitted proposals and evaluate their adequacy for the requirements of the graduation projects. This includes evaluating scope, feasibility, depth and breadth of knowledge and skills required, and whether a similar project has been done in the past, etc. Another objective is to assign student proposed projects to interested supervisors, if there are any. Anyone who is interested in supervising a certain student-proposed project should notify the GP Coordinator during the meeting. If more than one supervisor would like to supervise the project, the choice is given to the students, to select their preference. Students' choice is the assigned supervisor for the project.

After the meeting, the GP coordinator fills the project idea proposal forms, and project description forms. A copy of the forms is kept in the GP Coordinator's records, and a copy is sent to the designated parties (students and supervisors).

8.1.5. Project Announcement

Once proposals are approved by the GP committee, they are announced to students (excluding proposals submitted by students which are assigned to a specific supervisor who agrees to supervise). This usually takes place by the beginning of week 2. All projects are listed with their descriptions and supervisors. Students have a chance to

discuss with the supervisors the projects proposed. This enables them to make a decision when preparing the projects preference list.

8.1.6. Project Assignment to Groups

The general strategy for project assignment to each student is to assign the project based on CGPA. Students first submit their projects preference list and all details including cumulative GPA, by the end of week 2. Project preference forms are sorted in decreasing order of CGPA. The student with highest GPA gets assigned his/her first choice in projects preference list, the next highest gets his/her first choice if it is different from first student's choice, otherwise he/she gets his/her second choice, and so on. The process is repeated until all students are assigned to a project, ensuring a good mix of CGPA in each group as mentioned in section 8.1.1 such that the average CGPA of all groups are similar. It is endeavored that each student gets a project as high a choice as possible from his/her preference. The result of the assignment process is announced by the beginning week 3, and all groups should immediately contact their supervisors and start working on the project.

8.1.7. Assignment of Examination Committee

Once projects are assigned, the process of assigning committee members to examine each project is performed. Examination committee assignments are usually based on design project interests of faculty. A project approval form, as shown in Appendix A3 should be signed by the examination committee, the supervisor, and the GP Coordinator. The original is stored in the GP Coordinator's records and a copy is sent to the supervisor.

8.1.8. Project Progress

Students in semester 1 of their project will start on executing project tasks in accordance with the project plan by week 5. Students in semester 2 will start on executing project tasks in accordance with the project plan by week 1. Upon the completion of the project tasks, the group should prepare a presentation in semester 1 and project report along with a second presentation in semester 2.

8.1.9. Examination

By the end of the semester (date and time shall be announced by the GP coordinator), all projects groups are required to undergo an oral presentation of their project and an examination, in which the students shall demonstrate the progress (semester 1) and completion (semester 2) of their projects. The GP coordinator should be notified of any constraints in time or date by students, supervisors, and examination committee at least one month prior the examination week. Any constraints provided after this period cannot be accepted. Once the schedule is finalized, it is extremely difficult to modify it except in exceptional cases approved by the Chairman.

8.1.10. Report Submission

Project groups are required to submit their final reports:

- Semester 1: date will be announced by GP coordinator (typically academic week # 15).
- Semester 2: date will be announced by GP coordinator (typically academic week # 15). A draft report shall be submitted to the supervisor for his recommendations. Any changes recommended by the examination committee **MUST** be incorporated in the final report and such changes shall be approved by the concerned examination committee member. A final report approval form must be signed by all members of the examination committee before preparing the final hard-bound copy of the project report.

8.1.11. Presentation and Demonstration

Presentation

The GP coordinator should announce dates and times of the examination schedule for semester 1 and semester 2 groups at least 1 week prior to the examination.

The Capstone design project presentation is very important because the acquired experience is intended to serve as the practical application of your engineering program and as the culmination of your studies in Electrical Engineering. In addition, communication and presentation skills are among the top priorities of any employer. Here are the general guidelines and requirements:

A visual presentation is required using PowerPoint and should contain slides with multimedia. The final presentation should highlight the basic content including the project goal, activities and results.

- Project title and team names
- Presentation outline
- Introduction, motivation and objectives
- Description of proposed project requirements
- Description of proposed project design
- Conclusion and future work that could be done on the project

The final presentation should address the following questions:

- Did the final project achieve the intended results or not and if not why?
- What difficulties arose during the course of the project and how did you resolve them?

General guidelines for final presentation

- Please do not read from the screen.
- Be sufficiently familiar with your presentation to speak fluidly
- Provide an introduction that grabs the attention of the audience
- Do not block your audience's view of the screen.
- Test your presentation early in the process to ensure its legibility.
- Make certain that your voice is audible from the back of the room.
- Look in the eyes of the audience as you make your presentation. Be relaxed, smile and speak naturally.
- Make sure that the project advisor has final presentation files at least a day in advance.
- Practice the complete presentation with the audiovisuals, more than once.

Please arrive in sufficient time to copy your presentation to the computer and test it before the session begins.

Project Demonstration

Examiners may wish to test the project implementation prior to the actual examination date; therefore groups are required to set-up their project prototypes

(including all hardware and software in one of the departmental laboratories. The project group should either arrange an appointment with the examination committee members to test their systems, or they may reserve a time slot for the examination committee, ensuring their availability, to come and test the system.

Semester 2: Conference Day (Engineering Day)

By the end of the semester, an open conference is organized for students to showcase their projects (poster sessions). Invitations are sent to local and national academic institutions as well as industry. This event may be integrated with career day.

Project Seminars

During the semester, graduation projects seminars will be held. It is important that students attend these seminars. These will usually cover important information about the graduation project process and are an opportunity for students to raise any issues and have discussions with regards to their own project, or the process in general.

9. Roles and Responsibilities

9.1. Student

Students are responsible for the following:

- Thoroughly reviewing the Graduation Projects Handbook
- Undertaking the project implementation with guidance, in a manner which develops their own intellectual independence.
- Complying with any professional, ethical issues associated with the project.
- Planning and completing the graduation project within the expected time period.
- Devoting sufficient time to the course.
- Be committed to the project.
- Agreeing with the supervisor on a regular schedule of meetings (3 hours per week)
- Providing evidence of the progress being made, including submission of any required reports.
- Attending all course seminars and be responsible for anything mentioned.
- Regularly reviewing the course blog (website) for announcements and downloads.

- Taking the initiative in raising with your supervisor any problems or difficulties with the project or any of the team members.
- Informing the coordinator if you have any problems with the supervision process.
- Becoming familiar with and abiding by University, and Department regulations.
- Developing a project and submitting it to the supervisor.
- Completing all requirements of the project.
- Meeting all established deadlines.
- Completing and documenting all research and required written work in the proper format.
- Using principles of research and writing that avoid plagiarism.
- Meeting, as scheduled and necessary, with the project supervisor.
- Procuring the required hardware and software and complete implementation of the project.
- Presenting a demo of the project before the project examination committee.

9.2. Supervisor

Supervisors are responsible for the following:

- Assisting the students in understanding the requirements of the Graduation Project.
- Providing regular feedback on project progress. Feedback can be oral or in written form.
- Assessing the progress of each student in the group.
- Providing guidance and advice on project issues.
- The supervisor should be aware of the roles and responsibilities of each member of the project team from the beginning. It is the responsibility of the supervisor to ensure that all students are doing their part of the work, if some are not doing the required tasks, it should be reflected upon their year work marks.
- Reviewing the project proposal and making sure it adheres to the department standards.
- Supervising and advising students throughout the process and evaluating project progress.

- Keeping a record of the team's progress and individual grade (hard copy+ soft copy)
- Notifying the coordinator if there are any problems with the group, with a single student, with regards to change of scope, team problems, or individual cases.
- Providing expertise or referring the student to others for expertise in the project knowledge area.
- Attending the group's oral presentation of the project to the project examination committee.
- Submitting the evaluation sheet to the GP coordinator.

9.3. Examination Committee

The project examination committee is responsible for:

- Reviewing the student graduation project deliverables submitted by the project group prior to the presentation (proposal, final documentation).
- Attending and evaluating the presentation of the examined project.
- Providing comments and recommendations to the project group.
- Asking appropriate questions based on the group's preparation in relation to the written report, the hardware/software used in the project and the oral presentation.
- Submitting the final evaluation of the presentation to the GP coordinator

9.4. GP Coordinator

The role of the GP coordinator along with members of GP coordination committee, lies in the general administration of projects to ensure the smooth running of the graduation projects process. His activities include:

- Ensuring that the project process conforms to the prescribed standards and the guidelines approved by the department.
- Manages and administers all project stages described in Section 2 of this handbook.
- Communicate requests and complaints issued by supervisors, students, or examination committee members to the GP committee.
- Inform supervisors and students of rules and regulations.
- Provide students and supervisors with advice and guidance.

- Administration of the final results.

9.5. Assessment

9.5.1 Introduction

Assessment for the graduation project is based on three main elements:

- The examination committee computes the first presentation (10 marks) based on
 - Presentation skills
 - English language
 - Assigned topics coverage
 - Knowledge and confidence
- The supervisor computes the year work score (60 marks) based on:
 - Attending weekly meetings.
 - Participation and discussion in weekly meetings with the supervisor.
 - Quality of periodic submitted work to the supervisor.
- The examination committee computes the final exam (30 marks) based on
 - Project Report
 - Presentation

The sections below describe each item in detail.

Mode of Evaluation:	MARKS
First Presentation Assessment (by Examiners)	10
Final Presentation Assessment (by Examiners)	20
Report Assessment (by Examiner)	10
Supervisor Assessment (Participation, Teamwork, Knowledge of project)	60
Total	100

9.5.2 Supervisors Evaluation

Attending weekly meeting with the supervisor counts for (20%) and participating in discussions during the meeting counts for (20%). The supervisor will also evaluate the quality of periodically submitted work, which counts for (20%). The supervisor will monitor and assess project milestones and deliverables which count for (20%). Example

milestones include project background, literature review, analysis, design, etc. Example deliverables include project proposal, and the project final documentation. Overall evaluation of the group interactions and teamwork counts for (20%). The overall assessment includes:

- Teamwork
 - Consistently worked together as a well-coordinated team; divided work among team members; team members pulled their own share.
- Communication/ leadership
 - Project leader was assigned; effectiveness of her role was clearly evident by the level of communication and coordination with each other and with the supervisor.
- Project Execution Skills
 - Management, Planning, Requirements Analysis, and Design.

The co-supervisor must periodically provide input to the supervisor regarding the activities of each student in the project group, which shall be taken into account in his evaluation.

9.5.3 Examination Committee's Evaluation

Details for semester-1 and semester-2 final evaluation are also available as separate attachments. Each committee member evaluates the project individually and an average of all examiners is computed to reach the final assigned score.

9.5.4 Course Ground rules

The following department rules will be applied:

- The deadline for submitting a hard copy (spiral bound) of the project report is one week before the presentation.
- If student does not submit the report on time, a 25% of the report grade will be deducted for every day's delay.
- Other additional rules by the supervisor

9.5.3. Intellectual property

Who owns the project deliverables?

The hardware, software and all associated documentation developed during semester 1 and semester 2 of the graduation project is property of KKU. Students are not allowed to market the systems they develop for the graduation project until they consult with the GP coordinator.

Project Publications

Project publications include any work related or as a result of the graduation project and published in a:

- National conference, symposium, or journal.
- International conference, symposium, or journal.
- Local, national, or international competitions.

All publications resulting from the project should be affiliated with:

Department of Electrical Engineering

College of Engineering

King Khalid University

Authorship

There a number of possible scenarios for publication authorship described below;

Publication is written solely by the supervisor

- Supervisor's idea
 - Supervisor as first author.
 - Project team acknowledged.
- Student's idea
 - Supervisor as first author.
 - Students as second authors.

Publication is written solely by the students

- Supervisor's idea
 - Supervisor as first author.
 - Contributing students as second authors.
 - Rest of the group acknowledged.
- Student's idea

- Contributing students as first authors.
- Supervisor and rest of the group should be acknowledged.

Publication is written by cooperation between supervisor and students

- Supervisor’s idea
 - Supervisor as first author.
 - Contributing students as second authors
 - Rest of the group acknowledged.
- Student’s idea
 - Contributing students as first author
 - Supervisor (if she agrees) in author list, after students
 - Rest of the group acknowledged.

10 Plagiarism

WordNet defines plagiarism as “a piece of writing that has been copied from someone else and is presented as being your own work.” [Wordnet, 2015].

Ref: "Wordnet," 21 02 2015. [Online]. Available: <http://wordnetweb.princeton.edu/perl/webwn>. [Accessed 21 02 2015]

Failure to observe these guidelines will lead to a charge of academic dishonesty.

While it is permissible to use material developed by other authors as part of your project, this should be done with proper citation and attribution and should only constitute a minor part of the overall project implementation.

10.1 Penalty for Plagiarism

You should check the rules and regulations of the university with regards to this matter [below mention web link]. In the event of any suspicions of plagiarism is detected, a committee will be formed to look into details of the act and decide on an appropriate punishment. Usually this involves receiving an “F” grade for the project. In certain circumstances, it might include an “F” grade for all courses taken during the semester. In some extreme cases, the student may be disqualified from obtaining the B.Sc degree.

For more information on plagiarism, please visit: <http://www.plagiarism.org/>

Appendix A1: Project Idea Proposal Form

Project Idea Proposal Form

Section 1: *(To be filled by the student)*

Date:

Project Title:

Design Project Domain:

Description of the Problem:

Design Content:

The Proposed Solution:

Project Scope:

Skills Required:

Team Members:

Section 2: *(To be filled by the GP Coordinator)*

Date Received:

Status:

- **Approved**
 - Assigned Supervisor: _____
- **Approved if the following comments are considered**
 - _____
- **Rejected, and reasons for rejection**
 - _____

GP Coordinator

(Signature/Date)

Appendix A2: Project Description Form

Project Description Form

Section 1: *(To be filled by the supervisor)*

Date:

Project Title:

Design Project Domain:

Description of the Problem:

Design Content:

The Proposed Solution:

Project Scope:

Skills Required:

Supervisor's Name:

Section 2: *(To be filled by the GP Coordinator)*

Date Received:

Status:

- **Approved**
 - Assigned Supervisor: _____
- **Approved if the following comments are considered**
 - _____
- **Rejected, and reasons for rejection**
 - _____

GP Coordinator

(Signature/Date)

Appendix A3: Project Approval Form

Project Approval Form

Date: _____

Project Title:

Supervisor:

Project summary:

Team Members

S.No.	University ID Number	Name
1.		
2.		
3.		

The above graduation project has been approved by the following committee:

Member-1

Member-2

Member-3

(Signature)

(Signature)

(Signature)

Supervisor

GP Coordinator

(Signature)

(Signature)

Appendix – B: Graduation Project Syllabus

Course Title	Graduation Project	Coordinator	Dr. Usman Mohammed Farooq
Course Code	591-EE -3	Credit Hrs.	3
Prerequisites	Department approval (Student should have no more than 40 credits of coursework).	Level/Year	9-10/5
Course Objective:			
<p>The main objective of this course is to impart practical knowledge of Electrical Engineering. The students will develop the ability to use software and hardware tools relevant to Electrical engineering to design and develop practical models of electrical engineering applications. The objectives of this course where student can:</p> <ul style="list-style-type: none"> ● Select and plan an engineering project involving analysis and design tasks ● Perform a literature survey ● Formulate, as a team, electrical engineering design ● Perform the relevant calculations, analysis, and implement his design. ● Understand economic, environmental issues related to technology. ● Evaluate the impact of engineering on societal issues. ● Communicate technical information in writing. ● Communicate in oral and critically evaluate technical information 			
Teaching Method: Independent study/research, group discussion, meetings are scheduled with the supervisor for the particular project. Each student’s group will meet together weekly, keeping detailed minutes of the meetings.			
Course Learning Outcome:			
<ul style="list-style-type: none"> ● An ability to apply knowledge of mathematics, science, and engineering relevant to electrical engineering ● Understanding of health & safety issues and legal responsibilities ● Analyze a problem and design a solution by applying mathematics, science and engineering principles ● Design and develop a system/model relevant to electrical engineering ● Design and implement a system/model based on specified requirements and constraints ● Staying abreast on the topic of the project and understanding the applications and implications of the project outcome ● Ability to use software/hardware and equipment relevant to the project topic ● Understanding the importance of continuous professional development ● Team working and interpersonal skills ● Professional and ethical responsibility ● Familiarity of current trends and developments ● Written communication skills ● Oral communication skills 			
Topic Covered	<ol style="list-style-type: none"> 1. Project proposal and Literature survey of the project topic, Problem definition 2. Design plan - Determining the required components/equipment/software and initiating the procurement 		

	<p>process</p> <ol style="list-style-type: none"> 3. Implementation plan - Learn to use the components / equipment / software and plan the project implementation stages (4 stages) 4. Presentation of objectives, literature and plan for project implementation 5. Implementation - Stage 1 Initial design and analysis 6. Implementation - Stage 2 Design and analysis and implementation of any modifications 7. Implementation - Stage 3 Final design and analysis Prepare plan for project report 8. Implementation - Stage 4 Test, troubleshoot and have a functional model of project. Project report: Introduction and literature chapters 9. Completion and submission of project report. Final presentation 10. Revision of report based on examiner's comments and approval by examiner's
Text Book (s):	
<ul style="list-style-type: none"> • Varies with the particular project. 	
Reference Materials:	
<ul style="list-style-type: none"> • Varies with the particular project. 	
Mode of Evaluation:	
First Presentation Assessment (by Examiners)	10
Final Presentation Assessment (by Examiners)	20
Report Assessment (by Examiner)	10
Supervisor Assessment (Participation, Teamwork, Knowledge of project)	60
Total	100
Course Ground Rules	
<p>The following department rules will be applied:</p> <ul style="list-style-type: none"> • The deadline for submitting a hard copy of the project report is one week before the presentation. • If student does not submit the report on time, a 25% of the report grade will be deducted for every day's delay. • All rules mentioned in the Senior Design Project Guidelines Document are applicable • Other additional rules by the supervisor 	

Appendix – C: Minimum Requirements of Graduation Project

The College of Engineering has been under process for accreditation by the Accreditation Board for Engineering and Technology (ABET). As part of our self-evaluation, and recommendations of ABET, the college is focusing on improving the quality of graduation projects (senior design project). Starting from the spring semester of 2017, every design project shall satisfy the following minimum requirements. The students, supervisors and examiners will complete senior project checklists. Departments will provide blank copies of the checklists. Appendix – C contains a sample checklist.

- **Real Life Problem:** The project should reflect a real-life problem related to the industry.
- **Advisory Committee:** It is recommended that each project should have at least one advisor from the academia and one advisor from the industry.
- **Situation Description:** A situation should be clearly described by the advisor(s). Problem definition: The design problem should be defined by the student(s) and should involve some coaching from the advisor(s).
- **Open-Ended:** The project should involve a problem that has no single solution.
- **Alternative Solutions:** At least two different solutions should be discussed by the student(s) for a situation. A comparison should be performed between the alternatives
- **Specifications & Regulations:** Adopted design specifications and regulations should be clarified in each design project.
- **Aesthetics:** It is beauty and appearance.
- **Rationale of the Project:** The roadmap of thinking and the rational of the selected design solution should be clarified. Also, student(s) and advisor(s) should prepare a one sheet 14 summarizing the curriculum sources contributed to the accumulated knowledge used to address the design project problem.
- **Statistics & Reliability:** An engineer usually uses database(s) or engineering model(s) to solve a specific problem. Statistical analysis should be performed for the

used database(s). Design reliability should be assessed. In some cases, risk assessment may be performed.

- **Team Work:** Advisor(s) should emphasize teamwork among students, as applicable
- **Professional Ethics:** All work should be original and not copied from others. In the case of project-team, work should be divided evenly between all members. Grade should be given on individual basis and based on the effort and performance of a student. All referenced materials should be documented. Professional ethics should be implemented and enforced by the advisor(s) and students.
- **Environmental Impact Statement:** Each project should include a section to assess the impact of such a project on the environment including, but not limited to, air, water, soil, etc. Culture & Social Assessment: The final product in some projects might have a direct or indirect short, medium or long-term impact on some sector(s) from the local, national and/or international society. In this case, the project report should assess the acceptability of the proposed design by the neighboring and/or end-user society.
- **Marketing & Financial Analysis:** Each project should include a cost estimate of the design and its implementation including time and material. Each project should address the marketability of the end product, which could be a manufactured product or service product.
- **Final Product:** A report should be written in clear English. A multimedia presentation is recommended. As a minimum, a power point presentation should be prepared. A one sheet summary should be prepared including the problem statement, design approach, important findings and one or more illustrations. Also, student(s) and advisor(s) should prepare a one sheet summarizing the curriculum sources contributed to the accumulated knowledge used to address the design project problem.

Appendix – D: Checklist for Minimum Requirements

Kingdom of Saudi Arabia
Ministry of Education
King Khalid University
College of Engineering



المملكة العربية السعودية
وزارة التعليم
جامعة الملك خالد
كلية الهندسة


A Sample Checklist for Minimum Requirements


Supervisor Name				
Project Title				
Student Names (s)				
ITEM*		IMPLEMENTED		
		Yes	No	Indicate page(s) in the report for yes, cite reason(s) for no**
Real life problem				
Advisory committee	One from industry			
	From other specializations			
Situation description				
Problem definition				
Open-ended				
Alternative solutions				
Aesthetics				
Specifications and regulations				
Statistics and reliability				
Teamwork				
Professional ethics				
Environmental impact statement				
Cultural and social assessment				
Financial analysis and marketing				
Final product				
(*) See Appendix A for definitions				
(**) Student(s) : Indicate page(s) in the report for yes, cite reason(s) for no Supervisor(s): Verify page(s) in the report for yes and reason(s) for no Examiner(s): Verify reason(s) for yes or no				

Appendix – E: Template for Graduation Project Report Format

Available on the Electrical Engineering department website under the ‘Graduation Projects’ tab.

Appendix – F: Evaluation forms

KINGDOM OF SAUDI ARABIA King Khalid University Faculty of Engineering Electrical Engineering Department		المملكة العربية السعودية جامعة الملك خالد كلية الهندسة قسم الهندسة الكهربائية			
Graduation Project Examination Committee Examiner Evaluation Form - First Presentation					
Project Title: Group No.:					
Presentation Assessment	Maxmarks	Student 1	Student 2	Student 3	Student 4
Presentation skills	Marks (2)				
Time management, voice clarity, body language					
English language	Marks (2)				
Fluency and correctness of English					
Assigned topics coverage	Marks (3)				
Accuracy and content of topics presented					
Knowledge and confidence	Marks (3)				
Correctness of answers in the Q&A session					
TOTAL	Marks (10)				
Examiner's Name: Examiner's Signature: Date:					

KINGDOM OF SAUDI ARABIA KingKhalidUniversity Faculty of Engineering Electrical Engineering Department		المملكة العربية السعودية جامعة الملك خالد كلية الهندسة قسم الهندسة الكهربائية		
Graduation Project Examination Committee Examiner Evaluation Form - Final Presentation				
Project Title: Group No.:				
Presentation Assessment	Max marks	Student 1	Student 2	Student 3
Presentation skills	Marks (4)			
Time management, voice clarity, body language				
English language	Marks (4)			
Fluency and correctness of English				
Assigned topics coverage	Marks (6)			
Accuracy and content of topics presented				
Knowledge and confidence	Marks (6)			
Correctness of answers in the Q&A session				
TOTAL	Marks (20)			
REPORT ASSESSMENT (Project objectives, Problem Statement, Literature Review, Research Methodology, Work Done / Results & Conclusion, Writing format)	Marks (10)			
OVERALL TOTAL	Marks (30)			
Examiner's Name: Examiner's Signature: Date:				



Graduation Project Examination Committee
Supervisor Evaluation Form

Project Title:

Student's ID	Supervisor Marks				Supervisors Total
	Attendance	Teamwork	Contribution	Knowledge of project	
	1 - 7.5	1 - 7.5	1 - 22.5	1 - 22.5	60

Supervisor's Name:

Supervisor's Signature:

Date: