



Faculty of Engineering

Senior Design Project Guide

1440-1441 H

2019-2020 G

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1. Overview

The senior design project (SDP) is an emulation of real-life engineering projects where students develop their technical and professional skills and apply their knowledge to solve a complicated engineering problem. The project is designed to enable the students to practice their research and problem-solving skills and enhance their communication, teamwork, time management and project planning skills. Furthermore, it emphasizes students' understanding of safety polices, ethical issues, conflict of interest as well as social and environmental impacts of engineering solutions.

Students undertaking senior design project work under the direct supervision of a faculty advisor. The students are expected to work on a team on an engineering problem, conduct sufficient literature survey, recognize the objectives of their work and identify any relevant constraints, perform experiments, build prototypes and/or produce simulations as appropriate to their problem, analyze the results and present their work in the form of a report and a presentation.

2. Senior Design Project Objectives

The objectives of the senior design project are:

1. Obtain practical experience in project definition and management.
2. Properly design and document a project based on technical requirements
3. Propose solutions to real problems, investigate their impacts, and implement them
4. Communicate project progress and findings in words and in writing.

3. Senior Project Outcomes

By the end of the senior project, the student should be able to:

- Identify the technical requirements of a project
- Conduct literature survey on a specific topic
- Apply knowledge acquired from the undergraduate curriculum and obtain new information to propose solutions to engineering problem
- Evaluate proposed solutions and select the optimal one
- Design and conduct experiments, as well as analyze and interpret data
- Apply standards and appropriate constraints, such as economic factors, safety, reliability, ethics, environmental, and social impact
- Work effectively in a team
- Apply project management skills
- Write a problem statement with detailed objective
- Communicate findings and design ideas using oral presentation and written report

4. Steps to Assign Senior Project

Students registered for the course apply for available projects individually or as a team. Students interested in a specific problem may approach a faculty member whose

specialty is compatible with the proposed project before the beginning of the term for approval. The process for project proposals and registration are as follows:

1. Supervisors submit the senior project proposal (*SDP Proposal Form*).
2. Proposals are presented in a department meeting for approval.
3. The approved proposals are announced to the students for selection process.
4. Students may apply for one or more of the approved projects (*SDP Application Form*).
5. If the number of students apply for a project exceeds five, the five students with highest GPAs will be selected.
6. Students are registered with the designated faculty member.

5. Project Teams

One of the main project objectives is to develop the teamwork skills. The formation of senior project teams is subject to the following requirements:

1. All senior projects must be conducted as teams of at least three members and no more than five students.
2. Project teams can be single discipline or multidisciplinary.

6. Senior Design Project Proposal

Senior project proposals are submitted by faculty members. The proposals will be reviewed by the department for approval. The proposal should include the following:

- An abstract comprises problem description, project goals, design constraints, and approaches and tool.
- Expected deliverables of the project which can be one or more of the following:

- 1. Prototype**

- 2. Publishing Paper**

- 3. Community Service**

Students can design project that has a helpful impact on local community and may have aspirational impact on global community. The design project can be also utilized to improve the environment

- 4. Participation at Contest**

Student may design project pursuing a local contest such as BAE System at University of Tabuk or international competition like International Exhibition of Invention

- 5. UT Launch Laboratory**

Students can utilize University of Tabuk (UT) Launch Laboratory facilities to develop a product or technology for commercial use. Thus, the student can start the journey of being entrepreneurs

- A list of any required hardware, software, training, estimated funds, and others.

- Mapping Senior Design Project to ABET Criteria.

7. Senior Design Project Prerequisites and Duration

Students must complete the required credit hours as well as certain courses depend on the field of study prior registering Senior Design Project I as described in the table below. Then, the student continues their project in Senior Design Project II. The completion of senior design project requires an academic year.

	Electrical Engineering	Mechanical Engineering	Industrial Engineering	Civil Engineering
Credits Hours	120	--	120	120
Prerequisites	ENG213, ELEN311, ELEN370	ME 315 ME 317 ME 392	--	*At least one of CE 432, CE 451 CE 461, CE 472

* depends on project discipline

8. Project Supervision and Expected Support

Students will be assigned a faculty member to follow-up and guide the students in the development of the project. If the project is sponsored by an external body, the assigned faculty member is responsible for direct communication and coordination with the sponsor company and the external supervisor. A senior project proposal should be submitted at the beginning of the course by the supervisor(s) for department approval. The students are responsible of organizing meetings with their supervisor, completing all the tasks of their project and submit prepare progress reports (*SDP Progress Report*). The supervisor's responsibility is to monitor, guide and assess the students and approve the progress reports. He does NOT carry on any work or tasks related to the project.

9. Senior Design Project Coordinator

The senior design project coordinator is responsible of:

- Announce the prospective proposal received from the faculty members.
- Assign students to projects.
- Organize seminars that cover the following topics:
 1. Teamwork skills
 2. Report writing
 3. Presentation skills
 4. Design requirements and realistic constraints
 5. Engaging in lifelong learning
 6. Engineering ethics
- Coordinate the evaluation of the project written reports, presentations and prototypes and calculate the results for each student.

10. Senior Design Project I

Students enrolled in *senior design project I* are expected to:

- Attend the seminars arranged by the Senior Design Project Coordinators.
- Form a project team and prepare the project plan (*SDP Management Plan*).
- Hold regular meetings with the supervisor.
- Submit progress reports (*SDP Progress Report*) as presented in Table I. Note the following:
 1. Each student will have an opportunity to act as a **team leader** throughout the project.
 2. **Design constraints** determine the difficulties associated with the project or approach implementation which limits the design specification and directs the utilized approach. Each design constraint is elaborated below for more illustration.
 1. **Economic**
 - Estimation cost of design components/parts
 - Actual Cost of design components/parts
 - The additional cost of design implementation, prototype
 - Listing the design components
 - Estimation cost of energy consumption
 2. **Environmental**

Describe any environmental impact related to project design, manufacture, or usage
 3. **Manufacturability**

Describe any issues or encounters related to project manufacture
 4. **Sustainability**

Describe any issues or encounters associated with maintaining, improving, or upgrading the system performance,
 5. **Ethical**

Describe ethical implications relating to the design, manufacture, use, or misuse of the project.
 6. **Health and Safety**

Describe any health and safety concerns associated with the design, manufacture, or use of the project.
 7. **Social Politics**

Describe any social and political concerns associated with design, manufacture, or use, e.g., vision 2030 initiatives can be relevant for your project
 8. **Development**

Describe any new tools or techniques, used for either development or analysis that you learned independently during your project.
- Submit, by the end of the semester, a final report before the announced deadline and present their work to the evaluation committee.

TABLE 1: Task Descriptions and Timelines of SDP I

#	Task Title	Task Description	Team Leader	Deliverables	Deadline
1	Initial Project Proposal	Faculty member develop an initial proposal so that the student can pick.	Advisor	SDP Proposal Form (.pdf)	<u>Week 1</u>
2	Team Selection	Choosing team members and advisors. Each Student is responsible for executing each part of the project.	All Students	SDP Application Form (.pdf)	<u>Week 2</u>
3	Final Project Proposal	Faculty member develop a final proposal considering ideas/suggestions provided by the students	Advisor	SDP Proposal Form (.pdf)	<u>Week 4</u>
3	Task Assignment	Each student will be assigned as a team leader for each subsequent part of the senior design project	All Students	SDP Project Management plan (.pdf)	<u>Week 4</u>
4	Literature Review	-The students must conduct a literature review of patents and publications related to the project and ensure the selected references are quality. Thus, the student can be critical of what they read. - GoogleScholar is one of the great resources for finding high-quality papers and is strongly recommended	Student A; one of the students	SDP Progress Report Form (.doc)	<u>Week 8</u>
5	Problem Formulation and Design Constrains	-Student properly understand the problem, and refine the objectives, constrains, and scope of work.	Student B; one of the students	SDP Progress Report Form (.doc)	<u>Week 9</u>
6	Initial Schematic or Layout	Student develop a detailed schematic or layout including all project components. Student also develop a detailed schedule for each milestone in the project, typically three milestones.	Student C; one of the students	SDP Progress Report Form (.doc)	<u>Week 13</u>
7	Final Report		Student D; one of the students	SDP Final Report Template (.doc)	<u>Week 14</u>
8	Project Presentation		Student E; one of the students	SDP Presentation Template (.ppt)	<u>Week14</u>

11. Senior Design Project II

Students enrolled in the in *Senior Design Project II* should:

- Complete their projects which they started the previous semester by implementing the milestones as mentioned in the initial schematic/layout of Senior Design Project I.
- Prepare the project plan (*SDP Management Plan*) for execution and delivery
- Submit progress reports (*SDP Progress Report*) as presented in Table II.
- Attend the seminars arranged by the Senior Design Project Coordinators.
- Hold regular meetings with the supervisor.
- Prepare final design *Poster, Report, and Presentation* as scheduled in Table II.
- Present the **Prototype** on the contest typically at the end of Spring Semester, the date will be announced at the beginning of Spring term.

TABLE 1I: Task Descriptions and Timelines of SDP II

#	Task Title	Task Description	Team Leader	Deliverables	Deadline
1	Execution Milestone I	Students begin implementing the project as proposed	Student A; one of the students	SDP Progress Report Form (.doc)	<u>Week 4</u>
2	Execution Milestone II	Students continue implementing the design and refine requirement and specification if needed	Student B; one of the students	SDP Progress Report Form (.doc)	<u>Week 8</u>
3	Execution Milestone III	Completing the design and delivering the intended outcomes of the design.	Student C; one of the students	SDP Progress Report Form (.doc)	<u>Week 13</u>
4	SHOWCASE-prototype & poster)		Student E; one of the students	SDP Poster Template (.doc)	<u>Week 14</u>
5	Oral Presentation		Student D; one of the students	SDP Presentation Template (.doc)	<u>Week 15</u>
6	Final Report		Student A; one of the students	SDP Final Report Template (.doc)	<u>Week 16</u>

12. Final Project Delivery

Before posting the final, each group of students should submit the following to the coordinator:

- Two copies of the final report.
- A prototype (if applicable).

Plagiarism, including uncited use of any statements or ideas will not be tolerated.

13. References

- [1] B. Karagözoğlu, A guide to engineering design methodologies and technical presentation, Scientific Publishing Center, King Abdulaziz University, 2008.
- [2] Senior Project and Professional Documents Manual, College of Agriculture, California Polytechnic State University, California, 2010.
- [3] IEEE Ethics Policy, Institute of Electrical and Electronic Engineers, <https://www.ieee.org/>
- [4] Code of ethics, Saudi Council of Engineers, <http://www.saudieng.sa/English/Pages/default.aspx>
- [5] Ashraf Saad, Senior Capstone Design Experiences for ABET Accredited Undergraduate Electrical and Computer Engineering Education, IEEE, 2007, P. 294-299.
- [6] Senior Design Guidelines, College of Engineering, King Faisal University, 2014. <https://www.kfu.edu.sa/en/Colleges/AhsaEngineering/Documents/Senior%20Design/Senior%20Design%20Guidelines.pdf>
- [7] Senior Design Project Handbook, Department of Electrical Engineering, College of Engineering, Qatar University, 2010.

14. Appendixes

14.1 Appendix I

Senior Design Project Assessment Rubrics

14.2 Appendix II

Senior Design Project Forms

- 1. SDP Proposal Form*
- 2. SDP Application Form*
- 3. SDP Management Plan*
- 4. SDP Progress Report*

14.3 Appendix III

Final Senior Project Report Template

14.4 Appendix IV

Code of Ethics for Engineers

Appendix I

Senior Design Project Assessment Rubrics

SO(3) An ability to communicate effectively with a range of audiences, (Written Communication).

	Unsatisfactory (1)	Beginning (2)	Developing (3)	Satisfactory (4)	Exemplary (5)	Score
Produce a quality of writing	Unable to gather relevant data and researches and to use proper grammar and formatting	Barely gather relevant data and researches and rarely use proper grammar and formatting	can collect the relevant data and researches and use proper grammar and formatting to some extent	Mostly can collect the relevant data and researches and typically use proper grammar and formatting	Gather all the relevant data and researches and always use proper grammar and formatting	
Organize the content in a logical fashion	Does not organize the content in logical fashion	Rarely organize the content in logical fashion	Organize, to some extent, the content in a logical fashion	Mostly organize the content in logical fashion	Organize all the content in logical fashion	
Use Graphs, Figures, Tables, and Equations	Does not use graphs, figures, tables, and equations	Barley use graphs, figures, tables, and equations	Use, to some extent, graphs, figures, tables, and equations	Mostly use graphs, figures, tables, and equations	Always use graphs, figures, tables, and equations	

SO(3) An ability to communicate effectively with a range of audiences, (Oral Communication).

	Unsatisfactory (1)	Beginning (2)	Developing (3)	Satisfactory (4)	Exemplary (5)	Score
Produce a quality of writing	Unable to gather relevant data and researches and to use proper grammar and formatting	Barely gather relevant data and researches and rarely use proper grammar and formatting	can collect the relevant data and researches and use proper grammar and formatting to some extent	Mostly can collect the relevant data and researches and typically use proper grammar and formatting	Gather all the relevant data and researches and always use proper grammar and formatting	
Organize the content in a logical fashion	Does not organize the content in logical fashion	Rarely organize the content in logical fashion	Organize, to some extent, the content in a logical fashion	Mostly organize the content in logical fashion	Organize all the content in logical fashion	
Use Graphs, Figures, Tables, and Equations	Does not use graphs, figures, tables, and equations	Barley use graphs, figures, tables, and equations	Use, to some extent, graphs, figures, tables, and equations	Mostly use graphs, figures, tables, and equations	Always use graphs, figures, tables, and equations	
Use delivery techniques	Unable to use delivery techniques such as posture, gesture, and eye contact to engage the audience during presentations.	Barely use delivery techniques such as posture, gesture, and eye contact to engage the audience during presentations.	Use some of the delivery techniques such as posture, gesture, and eye contact to engage the audience during presentations.	Use most of the delivery techniques such as posture, gesture, and eye contact to engage the audience during presentations.	Use all delivery techniques such as posture, gesture, and eye contact to engage the audience during presentations.	
Respond well to questions	Does not respond well to questions	Barely respond well to questions	Sometimes respond well to questions	Mostly respond well to questions	Always respond well to questions	

SO(4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

	Unsatisfactory (1)	Beginning (2)	Developing (3)	Satisfactory (4)	Exemplary (5)	Score
Know the code of ethics for the discipline.	Student does not know what a code of ethics and professional responsibility is.	Student barely knows what a code of ethics and professional responsibility for the discipline is.	Student has some knowledge of the code of ethics and professional responsibility for the discipline.	Student is mostly aware of the code of ethics and professional responsibility for the discipline.	Student completely aware of the code of ethics and professional responsibility for the discipline.	
Recognize the ethical and professional responsibilities of a problem in the discipline.	Student is unable to recognize the ethical and professional responsibilities of a problem in the discipline.	Student can barely recognize the ethical and professional responsibilities of a problem in the discipline.	Student can recognize the ethical and professional responsibilities of a problem in the discipline to some extent.	Student can mostly recognize the ethical and professional responsibilities of a problem in the discipline.	Student can always recognize the ethical and professional responsibilities of a problem in the discipline.	
Explain professional, ethical, environmental, economical, and social considerations in an engineering context.	Student is unable to explain professional, ethical, environmental, economical, and social considerations in an engineering context.	Student can barely explain professional, ethical, environmental, economical, and social considerations in an engineering context.	Student can explain, to some extent, professional, ethical, environmental, economical, and social considerations in an engineering context.	Student can mostly explain professional, ethical, environmental, economical, and social considerations in an engineering context.	Student can always explain professional, ethical, environmental, economical, and social considerations in an engineering context.	

SO(5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

	Unsatisfactory (1)	Beginning (2)	Developing (3)	Satisfactory (4)	Exemplary (5)	Score
Demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	Doesn't demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	Rarely demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	Sometimes demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	Mostly demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	Always demonstrate an ability to establish goals, plan tasks, and meet objectives in a team environment	
Fulfill different roles on teams	Doesn't perform any duties of the assigned role	Rarely performs duties and assigned role	Performs some of the duties and assigned role	Performs most of the duties and assigned role	Performs all duties and assigned role	
Establish an inclusive environment that values the contributions of all team members	Doesn't establish an inclusive environment that values the contributions of all team members	Rarely establish an inclusive environment that values the contributions of all team members	Sometimes establish an inclusive environment that values the contributions of all team members	Mostly establish an inclusive environment that values the contributions of all team members	Always establish an inclusive environment that values the contributions of all team members	
Perform actions that demonstrate leadership in interactions with team members	Doesn't perform actions that demonstrate leadership in interactions with team members	Rarely perform actions that demonstrate leadership in interactions with team members	Sometimes perform actions that demonstrate leadership in interactions with team members	Usually perform actions that demonstrate leadership in interactions with team members	Routinely perform actions that demonstrate leadership in interactions with team members	

SO(7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

	Unsatisfactory (1)	Beginning (2)	Developing (3)	Satisfactory (4)	Exemplary (5)	Score
Identify the type of information needed for problem or task	Unable to identify information needed	Barely identifies information needed	Identifies some of the information needed	Identifies most of the information needed	Identifies all the information needed	
Apply appropriate strategies to acquire knowledge	Unable to apply appropriate strategies	Barely applies appropriate strategies	Applies some of the appropriate strategies	Applies most of the appropriate strategies	Applies all the appropriate strategies	
Demonstrate an ability to use information to solve a problem	Unable to use acquired information to solve a problem	Barely demonstrates ability to use acquired information to solve a problem	Demonstrates ability to use some of the acquired information to solve a problem	Demonstrates ability to use most of the acquired information to solve a problem	Demonstrates ability to use all the acquired information to solve a problem	

Appendix II

Senior Design Project Forms

1. *SDP Proposal Form*
2. *SDP Application Form*
3. *SDP Management Plan*
4. *SDP Progress Report*

SDP Proposal Form

 <p>جامعة تبوك University of Tabuk</p>	<p style="text-align: center;">University of Tabuk Faculty of Engineering</p> <p style="text-align: center;">Department of Electrical Engineering</p> <p style="text-align: center;">Senior Design Project Proposal Form</p>	<p>College Vision A distinguished and pioneering college locally and internationally in the field of engineering education, innovative research, and building a knowledge society</p>
Advisor Contact Information	<p>Name:</p> <p>Email:</p> <p>Office:</p> <p>Phone: 014456 -</p>	
Project Abstract	<p>Include ALL project goal(s), design constraints, and approaches and tool(s)</p>	
Expected Deliverables	<p>Prototype</p> <p>Explain the expected outcome(s)</p>	

SDP Proposal Form-Cont.

Required Recourses	Number of Students:	
	Specialized Training:	
Required Hardware/Software:		
Estimated fund required (SR):		
Other Requirements:		
Relation to ABET Criteria	Specify the following statements as they relate to your proposed project	Justification if it is not related
	The project gives students the opportunity to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires students to identify, formulate, and solve complex engineering problems	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires students to communicate effectively and develop leadership skills	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires the students to recognize ethical and professional responsibilities in engineering context	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires collaboration of students from other programs	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires students to apply knowledge of mathematics, science and engineering	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The project requires students to acquire and apply new knowledge as needed, using appropriate learning strategies	Yes <input type="checkbox"/> No <input type="checkbox"/>
	The students are required to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Yes <input type="checkbox"/> No <input type="checkbox"/>
	SDP Committee	Approved
Not Approved		

SDP Application Form

 <p>جامعة تبوك University of Tabuk</p>	University of Tabuk Faculty of Engineering Department of Electrical Engineering Senior Design Project Application Form	College Vision A distinguished and pioneering college locally and internationally in the field of engineering education, innovative research, and building a knowledge society																																																												
Instructions	<ol style="list-style-type: none"> Senior design project (SDP) is a continuing course where students register for SDP I in the fall semester and register for SDP II in the spring semester. Students applying for SDP I must have successfully passed at least 120 credit hours, including the prerequisites of respective projects. This form is to be completed electronically by students willing to register for the SDP and emailed to the registrar by the announced deadline. SDP committee will assign advisors to students according to their choices, number of applicants, and capacity of section. 																																																													
Student	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="background-color: #cccccc;">1. Personal data</th> </tr> <tr> <th style="width: 33%;">Name</th> <th style="width: 15%;">ID</th> <th style="width: 33%;">Phone Number:</th> <th colspan="2" style="width: 19%;">GPA</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td colspan="2"> </td> </tr> <tr> <th colspan="5" style="background-color: #cccccc;">2. ID's of preferred teammates (Optional)</th> </tr> <tr> <th style="width: 20%;">Team member (1)</th> <th style="width: 20%;">Team member (2)</th> <th style="width: 20%;">Team member (3)</th> <th style="width: 20%;">Team member (4)</th> <th style="width: 20%;">Team member (5)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <th colspan="5" style="background-color: #cccccc;">3. Choices (From the list of announced projects)</th> </tr> <tr> <td style="width: 5%;">1</td> <td style="width: 35%;"> </td> <td style="width: 5%;">6</td> <td style="width: 35%;"> </td> <td style="width: 20%;">11</td> </tr> <tr> <td>2</td> <td> </td> <td>7</td> <td> </td> <td>12</td> </tr> <tr> <td>3</td> <td> </td> <td>8</td> <td> </td> <td>13</td> </tr> <tr> <td>4</td> <td> </td> <td>9</td> <td> </td> <td>14</td> </tr> <tr> <td>5</td> <td> </td> <td>10</td> <td> </td> <td>15</td> </tr> </table>		1. Personal data					Name	ID	Phone Number:	GPA							2. ID's of preferred teammates (Optional)					Team member (1)	Team member (2)	Team member (3)	Team member (4)	Team member (5)						3. Choices (From the list of announced projects)					1		6		11	2		7		12	3		8		13	4		9		14	5		10		15
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SDP Management Plan

 <p>جامعة تبوك University of Tabuk</p>	University of Tabuk Faculty of Engineering Senior Design Project Management Plan	College Vision A distinguished and pioneering college locally and internationally in the field of engineering education, innovative research, and building a knowledge society																																	
INSTRUCTIONS	<ol style="list-style-type: none"> This plan is to be prepared by the project team and is considered an essential part of the project. The form must be filled electronically and submitted to the project supervisor no later than the end of the third week of the term. As per the agreement between project team members, a team member will be in charge of a specific task and will be responsible for preparing and submitting a progress report for that task. However, the implementation of the task is the responsibility of all team members. Following through with this plan will contribute to the final project grade. 																																		
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SDP Management Plan-Cont

TASK 3	Title			
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	Start date		Completion date	
TASK 4	Title			
	Responsible member			
	Description			
	Outcomes of this phase			
	Start date		Completion date	
TASK 5	Title			
	Responsible member			
	Description			
	Outcomes of this phase			
	Start date		Completion date	
TASK 6	Title			
	Responsible member			
	Description			
	Outcomes of this phase			
	Start date		Completion date	
ADVISOR'S APPROVAL	Comments and Recommendations			
	Signature			

SDP Progress Report

 جامعة تبوك University of Tabuk	University of Tabuk Faculty of Engineering Senior Design Project Progress Report	College Vision A distinguished and pioneering college locally and internationally in the field of engineering education, innovative research, and building a knowledge society																																								
INSTRUCTIONS	<ol style="list-style-type: none"> 1. This report is considered an essential part of you project. 2. It must be filled electronically in the specified dates and submitted to your advisor 3. It is the responsibility of team leader to complete this report, however, the task itself is the responsibility of the whole team 4. Advisor's grade is given based on data provided in this report <div style="text-align: right; margin-top: 10px;"> <input style="border: 1px solid red; padding: 2px 5px;" type="button" value="Click To Clear"/> </div>																																									
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SDP Progress Report-Cont.

CURRENT TASK	Description					
	Responsible member					
	Actual Start date					
	Planned Completion date					
	Status					
	Comments on the status					
	Work distribution by the responsible member. Who is in charge of what					
	Has everyone in your team performed his role?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	Comments on the team members performance					
	Outcomes of this phase					
	Attachments					
	Deviation from Project Proposal and Plan					
ADVISOR'S APPROVAL	Evaluation of team members					
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	Comments					

Appendix III

Final Senior Project Report Template & Guidelines

Appendix IV

Code of Ethics for Engineers

1. *IEEE Code of Ethics*
2. *Code of Ethics for Engineers by National Society of Professional Engineers*
3. *Code of Ethics by Saudi Council of Engineers*

IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members, and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to hold paramount the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding by individuals and society of the capabilities and societal implications of conventional and emerging technologies, including intelligent systems;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Code of Ethics for Engineers

Preamble

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

II. Rules of Practice

1. Engineers shall hold paramount the safety, health, and welfare of the public.
 - a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
 - b. Engineers shall approve only those engineering documents that are in conformity with applicable standards.
 - c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code.
 - d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise.
 - e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.
 - f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required.
2. Engineers shall perform services only in the areas of their competence.
 - a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.
 - b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.
 - c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment.
3. Engineers shall issue public statements only in an objective and truthful manner.
 - a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current.
 - b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter.
 - c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties,

unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters.

4. Engineers shall act for each employer or client as faithful agents or trustees.
 - a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.
 - b. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
 - c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.
 - d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions with respect to services solicited or provided by them or their organizations in private or public engineering practice.
 - e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member.
5. Engineers shall avoid deceptive acts.
 - a. Engineers shall not falsify their qualifications or permit misrepresentation of their or their associates' qualifications. They shall not misrepresent or exaggerate their responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint venturers, or past accomplishments.
 - b. Engineers shall not offer, give, solicit, or receive, either directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of a contract. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fee in order to secure work, except to a bona fide employee or bona fide established commercial or marketing agencies retained by them.

III. Professional Obligations

1. Engineers shall be guided in all their relations by the highest standards of honesty and integrity.
 - a. Engineers shall acknowledge their errors and shall not distort or alter the facts.
 - b. Engineers shall advise their clients or employers when they believe a project will not be successful.
 - c. Engineers shall not accept outside employment to the detriment of their regular work or interest. Before accepting any outside engineering employment, they will notify their employers.
 - d. Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.
 - e. Engineers shall not promote their own interest at the expense of the dignity and integrity of the profession.
2. Engineers shall at all times strive to serve the public interest.
 - a. Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.
 - b. Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
 - c. Engineers are encouraged to extend public knowledge and appreciation of engineering and its achievements.
3. Engineers are encouraged to adhere to the principles of sustainable development¹ in order to protect the environment for future generations.
4. Engineers shall avoid all conduct or practice that deceives the public.
 - a. Engineers shall avoid the use of statements containing a material misrepresentation of fact or omitting a material fact.
 - b. Consistent with the foregoing, engineers may advertise for recruitment of personnel.
 - c. Consistent with the foregoing, engineers may prepare articles for the lay or technical press, but such articles shall not imply credit to the author for work performed by others.
5. Engineers shall not disclose, without consent, confidential information

- concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve.
- a. Engineers shall not, without the consent of all interested parties, promote or arrange for new employment or practice in connection with a specific project for which the engineer has gained particular and specialized knowledge.
 - b. Engineers shall not, without the consent of all interested parties, participate in or represent an adversary interest in connection with a specific project or proceeding in which the engineer has gained particular specialized knowledge on behalf of a former client or employer.
6. Engineers shall not be influenced in their professional duties by conflicting interests.
 - a. Engineers shall not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their product.
 - b. Engineers shall not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with clients or employers of the engineer in connection with work for which the engineer is responsible.
 7. Engineers shall not attempt to obtain employment or advancement or professional engagements by untruthfully criticizing other engineers, or by other improper or questionable methods.
 - a. Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgment may be compromised.
 - b. Engineers in salaried positions shall accept part-time engineering work only to the extent consistent with policies of the employer and in accordance with ethical considerations.
 - c. Engineers shall not, without consent, use equipment, supplies, laboratory, or office facilities of an employer to carry on outside private practice.
 8. Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action.
 - a. Engineers in private practice shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.
 - b. Engineers in governmental, industrial, or educational employ are entitled to review and evaluate the work of other engineers when so required by their employment duties.
 - c. Engineers in sales or industrial employ are entitled to make engineering comparisons of represented products with products of other suppliers.
 9. Engineers shall accept personal responsibility for their professional activities, provided, however, that engineers may seek indemnification for services arising out of their practice for other than gross negligence, where the engineer's interests cannot otherwise be protected.
 - a. Engineers shall conform with state registration laws in the practice of engineering.
 10. Engineers shall not use association with a nonengineer, a corporation, or partnership as a "cloak" for unethical acts.
 11. Engineers shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others.
 - a. Engineers shall, whenever possible, name the person or persons who may be individually responsible for designs, inventions, writings, or other accomplishments.
 - b. Engineers using designs supplied by a client recognize that the designs remain the property of the client and may not be duplicated by the engineer for others without express permission.
 - c. Engineers, before undertaking work for others in connection with which the engineer may make improvements, plans, designs, inventions, or other records that may justify copyrights or patents, should enter into a positive agreement regarding ownership.
 - d. Engineers' designs, data, records, and notes referring exclusively to an employer's work are the employer's property. The employer should indemnify the engineer for use of the information for any purpose other than the original purpose.
 - e. Engineers shall continue their professional development throughout their careers and should keep current in their specialty fields by engaging in professional practice, participating in continuing education courses, reading in the technical literature, and attending professional meetings and seminars.

Footnote 1 "Sustainable development" is the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development.

As Revised July 2007

"By order of the United States District Court for the District of Columbia, former Section 11(c) of the NSPE Code of Ethics prohibiting competitive bidding, and all policy statements, opinions, rulings or other guidelines interpreting its scope, have been rescinded as unlawfully interfering with the legal right of engineers, protected under the antitrust laws, to provide price information to prospective clients; accordingly, nothing contained in the NSPE Code of Ethics, policy statements, opinions, rulings or other guidelines prohibits the submission of price quotations or competitive bids for engineering services at any time or in any amount."

Statement by NSPE Executive Committee

In order to correct misunderstandings which have been indicated in some instances since the issuance of the Supreme Court decision and the entry of the Final Judgment, it is noted that in its decision of April 25, 1978, the Supreme Court of the United States declared: "The Sherman Act does not require competitive bidding."

It is further noted that as made clear in the Supreme Court decision:

1. Engineers and firms may individually refuse to bid for engineering services.
2. Clients are not required to seek bids for engineering services.
3. Federal, state, and local laws governing procedures to procure engineering services are not affected, and remain in full force and effect.
4. State societies and local chapters are free to actively and aggressively seek legislation for professional selection and negotiation procedures by public agencies.
5. State registration board rules of professional conduct, including rules prohibiting competitive bidding for engineering services, are not affected and remain in full force and effect. State registration boards with authority to adopt rules of professional conduct may adopt rules governing procedures to obtain engineering services.
6. As noted by the Supreme Court, "nothing in the judgment prevents NSPE and its members from attempting to influence governmental action . . ."

Note: In regard to the question of application of the Code to corporations vis-a-vis real persons, business form or type should not negate nor influence conformance of individuals to the Code. The Code deals with professional services, which services must be performed by real persons. Real persons in turn establish and implement policies within business structures. The Code is clearly written to apply to the Engineer, and it is incumbent on members of NSPE to endeavor to live up to its provisions. This applies to all pertinent sections of the Code.



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 Alexandria, Virginia 22314-2794
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Saudi Council of Engineers

Code of ethics

Preface

The engineering profession and the services provided by engineers depends significantly on the progress of civilization and the protection and harnessing of natural resources to serve the community and increase the standard of living. Thus, it becomes necessary for engineers to provide their professional services according to ethical standards and rules observing honesty, truthfulness and perfection.

Since the Saudi Council of Engineers is concerned with and aims to promote the profession of engineering and all that would develop and raise the level of the profession and its practitioners under its law promulgated by the Royal Decree No. 36 on 26/09/1423H, and since its vision is to "sophisticate the profession of engineering and enable engineers and institutions of engineering to reach optimal solutions, to improve performance level, and to encourage creativity and innovation to achieve a prestigious international position," the Council has opined to present these rules to engineers and technicians in various positions to serve as professional rules determining proper professional dealing among themselves and with others to serve society.

Since justice, integrity, honesty, truthfulness, keeping one's word, never exposing secrets, mutual advice, mastery of work, and getting away from hurting others are in their entirety the morals and values advocated by Islam that urges to stick to them and to abide by applying them in everyday life, the Saudi Council of Engineers has taken into account these foundations, principles and values when preparing the rules and ethics governing the practice of the profession. Thus, all engineers should abide by these rules in all their professional practices in accordance with the Engineer Agreement signed in this regard.

May Allah grant us all success to all that is good

Rules and ethics of the practice of the engineering profession

General rules:

Rule One: Every engineer should build her/his professional reputation based on efficiency and proficiency of her/his services, and away from unfair competition with others.

Rule Two: Every engineer should seek to develop her/his personal abilities and efficiency, and should also provide professional development opportunities for engineers and technicians working under his supervision.

Rule Three: Every engineer should be committed to promoting the fundamental values and principles of the ethics of the engineering profession and should plant them within society. Regarding her/his conduct, every engineer should be s in ways that support and enhance the prestige and dignity of the profession and the secretariat of the locally and globally.

Rule Four: Regarding professional issues, every engineer shall act as a careful agent to the employer, and shall avoid any conflict of interests.

Rule Five: When submitting her/his ideas, views and decisions, every engineer should be keen to be objective and honest and confined to her/his field of expertise and professional experience.

Rule Six: When providing professional services, every engineer seeks to apply the highest standards of safety and environmental protection in order to achieve the public interest of individuals and society.

Rule One:

Every engineer should build her/his professional reputation based on efficiency and proficiency of her/his services, and away from unfair competition with others.

1-1 It is obligatory on every engineer not to directly or indirectly pay or offer commissions, gifts or rewards for getting a job with the aim of influence its accreditation. In addition, it is obligatory on every engineer not to make concessions irrelevant to the profession that may be used to influence the other competitors.

1-2 It is obligatory on every engineer not to compete with any other engineer in contradiction with the regulatory rules in order to replace the latter in a particular job, whether after knowing that specific steps have been taken towards her/his appointment or after s/he has already been appointed.

1-3 It is obligatory on every engineer not to criticize the reputation or performance of other engineers inappropriately, whether through criticizing and mutilation directly or indirectly.

1-4 It is obligatory on every engineer neither to overestimate the degree of her/his responsibilities in previous work, to be dishonest in the presentation of her/his professional and academic qualifications and past achievements, whether regarding her/him or her/his workers, nor to be dishonest in the presentation of the facts concerning employers, colleagues or partners.

1-5 Every engineer shall review professional service contracts on the basis of competence, professional qualifications and experience, and volume and scope of work, taking into account

the equity of appropriate compensations to other professionals and keeping on enhancing trust between all contracting parties.

1-6 Every engineer shall take into account the public interest in estimating the engineering services' cost.

1-7 Every engineer shall not undertake or agree to perform any engineering service for free in a way that may affect the professional level of the service provided.

1-8 No engineer shall unobjectively declare the engineering services as a means of propaganda. In addition, no engineer shall allow the use of her/his name in commercials by manufacturers, contractors and suppliers, unless the engineer has a real role in the advertisement.

Rule Two:

Every engineer shall continue the professional development by developing her/his personal efficiency and abilities, and shall provide professional development opportunities for engineers and technicians who work under his supervision.

2-1 An engineer shall work on developing his abilities in order to raise his professional level by every appropriate means, such as attending professional events, submitting specialized studies and researches, participating in meetings and activities of international professional bodies, and encouraging and urging his staff of engineers and technicians to do the same.

2-2 Every engineer shall give proper credit for engineering works to those to whom credit is due, and shall recognize the proprietary rights of others. Every engineer shall name the person(s) responsible for designs, inventions or accomplishments wherever possible.

2-3 Every engineer shall be fair in assigning works and tasks to other engineers, in proportion to the level of their expertise and training.

2-4 Every engineer shall provide all information regarding working conditions to engineers nominated for employment, and inform them of all matters relating to the proposed position. After hiring, he shall inform them of all changes that may happen and the commitment to the principle of estimating lucrative compensations, salaries and allowances for workers in the engineering field.

Rule Three:

Every engineer shall commit to promote the fundamental values and principles of the ethics of the engineering profession, and establish them in the society. In his behavior, he shall adhere to the techniques that support and promote the prestige, dignity and integrity of the profession locally and globally.

3-1 Every engineer shall commit to apply rules and ethics of the profession in all her/his professional practices, and participate in educational, training and professional activities in institutes, universities and business and professional institutions, in order to promote and establish professional concepts and raise the engineering awareness in society.

3-2 Every engineer shall assume his professional responsibility based on the rules respected by members of the community, and not contribute to any products that may be easy to use for unethical or banned purposes or result in immediate or long-term risks.

33 Every engineer shall refer to the Saudi Council of Engineers in case of disputes related to the ethics of the practice of the profession. In all cases, the priorities shall be determined according to the following order:

Government regulations and judicial decisions shall have the priority over professional regulations and laws.

Professional regulations and laws shall have the priority over contracts and individual interests.

34 Every engineer shall not participate in or allow the use of his name or the names of his partners on business by a person or an entity which he believes that it involved in a business or a professional practice based on fraud and cheating.

35 Every engineer shall not use the relationship, solidarity or participation with others as a means of covering up behaviors that are inappropriate to the profession.

Rule Four:

Regarding professional issues, Every engineer shall act as a careful agent to the employer, and shall avoid any conflict of interests.

4-1 Every engineer shall dedicate their technical knowledge and experience to the benefit of their employers/clients. Every engineer shall assume the responsibilities for their professional practices, and admit mistakes as it occurred, they shall avoid twisting or warping facts to justify wrong decisions.

4.2 Every engineer shall maintain the confidentiality of the information received by the same in the framework of the duties entrusted thereto and shall not disclose such information only after obtaining an approval to do so; with exception of the cases permitted by the regulations in force and appear to be in line with the applicable principles and code of ethics. Moreover, every engineer shall not use such information as a means to obtain personal gain only after obtaining the approval of the Employer. In any case it shall not be permissible to use such information if such use conflicts with the interests of the Employer or the society.

4-3 Every engineer shall deal with all parties with the utmost integrity and fairness whenever administrating any contracts or recruiting any personnel. Every engineer shall enter into an agreement before working for those parties to the extent that allows the same to make improvements, designs, innovations and other facilities that require keeping the rights thereof in writing or innovation; without resorting to deception as a means to induce others to work therewith.

4-4 Every engineer shall not perform any professional service for the account of any party outside of regular work hours only after informing the Employer of the same. Furthermore, every Engineer shall not use any equipment, materials, laboratories or office facilities pertaining to the Employer for personal purposes without obtaining the approval of the Employer on the same.

4-5 Every engineer shall not inspect the work of another engineer without informing the same or after the expiration of the contract relevant to such work; unless it is required by virtue of the nature of the job thereof.

4-6 Every engineer, working in the field of sales and manufacturing, is entitled to make comparisons between the products thereof and the products of other suppliers; taking into

account not to offer or provide any engineering consultancy, designs or advice except as specifically related to the equipment, materials or systems sold thereby or displayed for sale.

4-7 Every engineer shall avoid any conflict with the Employer's interests and shall notify the Employer immediately after being aware of the existence of any relations, business interests or circumstances that may affect the decisions thereof or the quality of the services provided thereby. Moreover, every Engineer shall avoid performing any work appears to be in conflict with Employer's interests.

4-8 Every engineer shall not accept any remuneration paid by a party for the services provided thereby in the same project or in exchange for any services relating to the same work unless it is expressly agreed in advance between all concerned parties. Moreover, every engineer shall not request nor accept any rewards, whether in cash or in kind; including any free engineering designs provided by the suppliers of materials; further to any equipment, devices or systems used in the description or identification of the products of those suppliers in the work carried out by this engineer. Furthermore, every engineer shall not, directly or indirectly, request nor accept any gifts given by any party dealing with the Employer or relevant to the work entrusted to the same.

Rule Five:

When submitting the ideas, views and decisions thereof, every engineer should ensure that such ideas, views and decisions are objective, authentic and fall within the area of specialization and professional experience of the same.

5-1 Every engineer shall be objective, honest and independent in making any engineering decisions that exclusively fall within the field of the scientific and practical qualification; to the extent that such decisions are only made in accordance with scientific and professional considerations. Every engineer shall benefit from all available specialized expertise and ask the assistance of his colleagues in accomplishing any work falling outside the field of the engineer's specialization.

5.2 When the engineer appears before courts or official commissions as an expert or witness to provide a technical testimony, the engineer shall show the engineering standpoint of the same based on the experience, expertise and knowledge of facts bearing in mind the utmost integrity, honesty and honor of the profession.

5.3 Every engineer shall not issue any reports, statements or comments about engineering issues if such reports, statements or comments are issued for the purposes of serving the interests of any party or parties unless a prior explicit statement identifying those parties acting on their own behalf is issued.

5.4 Every engineer shall be modest and moderate, while presenting his works and efficiency. Furthermore, the engineer shall avoid committing any act tending to promote his own interest at the expense of the profession's honesty, status and dignity.

5.5 In case of any conflict arising between the values and principles, and the professional services, engineers shall set their priorities as follows:

- Giving priority to human values over the nature's considerations.
- Giving priority to issues related to human rights over production and exploitation of technology.

- Giving priority to the society's general welfare over private interests.
- Giving priority to safety and security over functionality and material gains of technical solutions.

Rule Six:

When providing professional services, every engineer seeks to apply the highest standards of safety and environmental protection in order to achieve the public interest of individuals and society.

61 Every engineer shall comply with the approved standards of public safety and environmental protection, while preparing designs and schemes or upon approval and endorsement. The engineer shall also verify of such compliance, while making decisions and judgments, besides all relevant engineering practices. If the engineer has to provide engineering solutions that appear to cause threatening to public safety, health of environment or interest of society, the employer shall, in such case, be informed of all possible consequences.

62 Every engineer shall, as much as possible, provide brochures, including examining standards systems and quality control procedures, to the extent that allows the public to understand the degree of safety and security or the life span of designs, products and systems that he was responsible for.

63 Every engineer shall exert all efforts for the purpose of providing constructive services to the nation, in line with the applicable standards and values, promoting the society's interest and welfare, and complying with providing safety measures in all provided professional services.

64 When observing circumstances or conditions posing a threat to public safety, health of environment or interest of the society, the engineer shall notify the concerned entity of the available information, provide the required assistance and undertake the proper check to ensure safety and reliability of products or systems.