ISTANBUL TECHNICAL UNIVERSITY
ELECTRONICS AND COMMUNICATION ENGINEERING PROGRAM
SENIOR DESIGN PROJECT COURSE (EHB 492/EHB 492E) REGULATIONS

DEFINITIONS AND OBJECTIVES:

Engineering design requires the utilization of modern engineering methods to devise and implement a system, process, component or equipment with the end goal of meeting some desired needs. Engineering design procedure is a (possibly iterative) decision-making process where the basic sciences, mathematics, and engineering sciences are employed to reach the stated objective with optimal utilization of the available resources. Among the fundamental elements of the design process are the establishment of design objectives and criteria, realistic constraints, valid alternative solutions and their evaluation, construction of the solution, and evaluation of the solution.

Engineering Design: The process of devising a system, process or component to meet desired needs.

Teamwork: A project group is comprised of: 1) students from diverse backgrounds and interests (in order to support role-playing) e.g. systems analysis/design, costing/economics, and ii) students who bring unique skills developed in elective areas of specialization within the field.

Realistic Design Constraints

Technical and Performance – relating to the performance and other technical requirements of the proposed solution with respect to the addressed need.

Timing – effective scheduling related to the design, development, production and delivery of the project units.

Economic - relating to the cost, production, distribution, and consumption of goods and having practical or industrial significance.

Legal/Ethical – relating to appropriate professional conduct including the principles of honesty, fairness, caring, and respect for others, compliance with and relation to existing national and international standards and regulations.

Health and Safety – relating to the health and safety concerns of a product's manufacture, use, and disposal.
Manufacturability – relating to how a product can be manufactured efficiently and economically.
Environmental – relating to preserving and possibly improving the surrounding environment.
Political – pertaining to public policy or relating to affairs of state or administration.
Social – concerned with a broad grouping of people having common traditions, institutions, or collective activities and interests.
Sustainability – relating to the use of a resource so that the resource is not depleted or permanently damaged.

Engineering Standards

All engineering standards related to the project subject matter should get incorporated into the project report and other project material. These standards may include standards set by international (e.g. IEEE, IET, EU) and national (e.g. Turkish Standards Institute, ELECO) institutions.

Through the successful completion of the Senior Design Project (SDP) course EHB 492/EHB492E, Electronics and Communication Engineering program students are expected to attain the following student outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering to Electronics and Communication Engineering problems (student outcome "a"),
2. 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, manufacturability, and sustainability (student outcome "c"),
3. An ability to function on multi-disciplinary teams (student outcome "d"),
4. An ability to identify, formulate, and solve Electronics and Communication Engineering problems (student outcome "e"),
5. An understanding of professional and ethical responsibility (student outcome "f"),
6. An ability for effective communication (student outcome "g"),
7. An ability to understand and correctly interpret the impact of engineering solutions in a social/global context (student outcome "h"),

8. An ability to skillfully use modern engineering tools and techniques necessary for engineering design, analysis and applications (student outcome “k”),
9. An ability to function individually as well as part of a team (student outcome “m”).

SENIOR DESIGN PROJECT COURSE (EHB 492/EHB 492E) GUIDELINES

EHB 492/EHB 492E is the Senior Design Project (SDP) course for the Electronics and Communication Engineering program. EHB 492 is realized completely in Turkish, whereas EHB 492E is realized completely in English. Other than the language of instruction there is no difference in the course requirements. The SDP Course is effectively realized over two consecutive semesters. The requirements for the two semesters are as listed as below.

Semester 1:

1. Program faculty members submit their SDP topic suggestions for projects for which they want to act as an SDP advisor by filling out the SDP Topic Suggestion Form (FORM 1). They submit the form(s) to the program SDP committee until the 2nd week of the current semester. All submissions to the SDP committee are realized via the department administration. Faculty members may submit project topics individually or in groups composed of 2 faculty members.

2. SDP topic suggestions can also be made by student project groups or by industrial affiliates. Suggestion forms submitted by student project groups or industrial affiliates may also include the name and signature of faculty member(s) who has agreed to act as the SDP advisor.

3. All submitted SDP Topic Suggestions are evaluated by the SDP Commission. For SDP Topic Suggestions which are not accepted, a revised submission is requested in one week’s time. Modified SDP topic suggestions are re-evaluated, and those which are not accepted are finally rejected.

4. All SDP Topic Suggestions accepted by the SDP committee are publicly announced as a list on the departmental website by the 3rd week.

5. Students form project groups which are comprised of 2-5 students. Project groups fill out and submit the SDP Preference Form (FORM 2) to the SDP committee by the 5th week. This form should include the information for the group members and a selection for preferred project topics. For fewer or more students in a project group, a special permission from department administration is required.

6. SDP committee assigns each project group to a SDP topic. If there are students who are eligible to participate in the SDP but could not get involved in a project group, such students are assigned to possibly newly formed project groups by the SDP committee. These groups are again assigned to one of the remaining SDP topics.

7. For accepted SDP topics submitted by student project groups or industrial affiliates without a prior SDP advisor agreement, these SDP topics are assigned to appropriate faculty members for them to act as the SDP advisor.

8. To be able to formally register in the SDP course, students should fulfill pre-requisites of SDP as declared by the ITU Senate.

9. SDP committee has the authority of assigning students to groups and making necessary arrangements.

10. SDP advisors are required to monitor the project group members continuously during the SDP work and to evaluate them both individually and as a team.

11. All SDP Topic-SDP Advisor-Project Group assignments as finalized by the SDP committee are publicly announced as a list on the departmental website by the 6th week.

12. Each project group starts filling out the SDP Logbook starting with their first group meeting after the topic assignment announcement.

13. Project groups prepare and submit their SDP Proposal to the SDP committee by the 8th week. The SDP Proposal should get authorized by the SDP advisor prior to submission. The SDP Proposal should be consistent with SDP Proposal Draft Document (FORM 3), and it should cover the following chapters:

i. Presentation of related engineering problem/subject/assignment,
ii. Definition of design problem and constraints,
iii. Related theoretical knowledge, literature, standards, patents
iv. Alternative design options and selection criteria,
v. Optimum design solution with appropriate selection decisions,
vi. Cost analysis, feasibility, compatibility with related standards and regulations, environmental effects, ethical and legal concerns.

14. Project groups submit the current version of the SDP Logbook to the SDP committee and to the SDP advisor by the final week of the semester.

Semester 2:

1. Project groups prepare and submit their SDP Interim Report to the SDP committee and to the SDP advisor by the 7th week of the semester. The SDP Interim Report should get authorized by the SDP advisor. The SDP Interim Report should be consistent with SDP Interim Report Draft Document (FORM 4).

2. Project groups submit the current version of the SDP Logbook to the SDP committee and to the SDP advisor by the 8th week of the semester.

3. Project groups prepare and submit their SDP Final Report to the SDP committee and to the SDP advisor during the final week of the semester. The SDP Final Report should get authorized by the SDP advisor. The SDP Final Report should be consistent with SDP Final Report Writing Manual (FORM 5). For SDPs which cannot get completed on time, the SDP Additional Time Request Form (FORM 6) may be filled out and submitted on the first work day of the final week of the semester to defer the finalization of the project for one more semester.

4. The project groups submit 3 printed copies of the SDP Final Report to the department administration during the final week of the semester. The SDP Final Report Submission and Control Form (FORM 7) should get filled out and signed by students and the SDP advisor and submitted along with the SDP Final Report.

5. SDP Final Reports are checked by the SDP committee in terms of compatibility with SDP Report Writing Manual. SDP committee may request a revision for the SDP Final Report.

6. Project groups submit the final version of the SDP Logbook to the SDP committee and to the SDP advisor by the first day of the week right after semester termination.

7. SDP Advisor evaluates students' work based on the performance throughout the project. They can assign "VF" grade to some or all project members who are not qualified for the oral presentation by filling out the SDP Advisor-Group Evaluation Form (FORM 8). SDP advisor evaluates students according to their SDP outcomes and performance and assigns individual grades (out of 100 points) on the same form. SDP Advisor-Group Evaluation Forms are submitted to the SDP committee during the week right after semester termination.

8. SDP committee publicly announces the SDP oral presentation exam time schedule during the week right after semester termination.

9. SDP Oral Presentation Exam

i. The department prepares groups of accepted SDPs according to their subjects and assigns an examination committee to each group. Examination committee members are assigned by the Department Head after consulting with the SDP committee. SDP advisors are natural members of examination committees for the projects they supervised. Examination committees consist of a total of 4-5 faculty members.

ii. Examination committee chair and members are informed at least 3 days in advance about their assignment together with electronic copies of the SDP Interim Reports, SDP Logbook and SDP Final Reports in their sessions. A printed copy of each SDP Final Report is also submitted to the examination committee chair to make it available during the oral presentations.

iii. In addition to being a committee member, examination committee chair is responsible for starting and ending sessions, implementing the exam rules during the session, and sending the results to the department administration. The examination committee chair has the authority of making necessary decisions.

iv. Students give oral presentations in open sessions, open to all students and faculty members. The examination is entirely held in Turkish for EHB 492 and in English for EHB 492E. Oral presentation exam consists of two parts, namely the presentation and the following question/answer section.

v. Each examination committee members evaluate project groups in their session for the SDP Final Report, presentation and answers of group members to the questions. The committee members evaluate the following topics separately out of 100 full points (FORM 9).

   a. ability to design (Program Outcome “c”),
   b. ability to identify, formulate and solve engineering problems (Program Outcome “e”),
   c. ability for written and oral presentation (Program outcome “g”),
   d. ability to use modern engineering tools (Program outcome “k”).

10. Grades given by the committee members for each project group are recorded in Oral Exam Evaluation Form (FORM 10) and these forms are submitted to the department administration by the exam committee chair after the presentations.

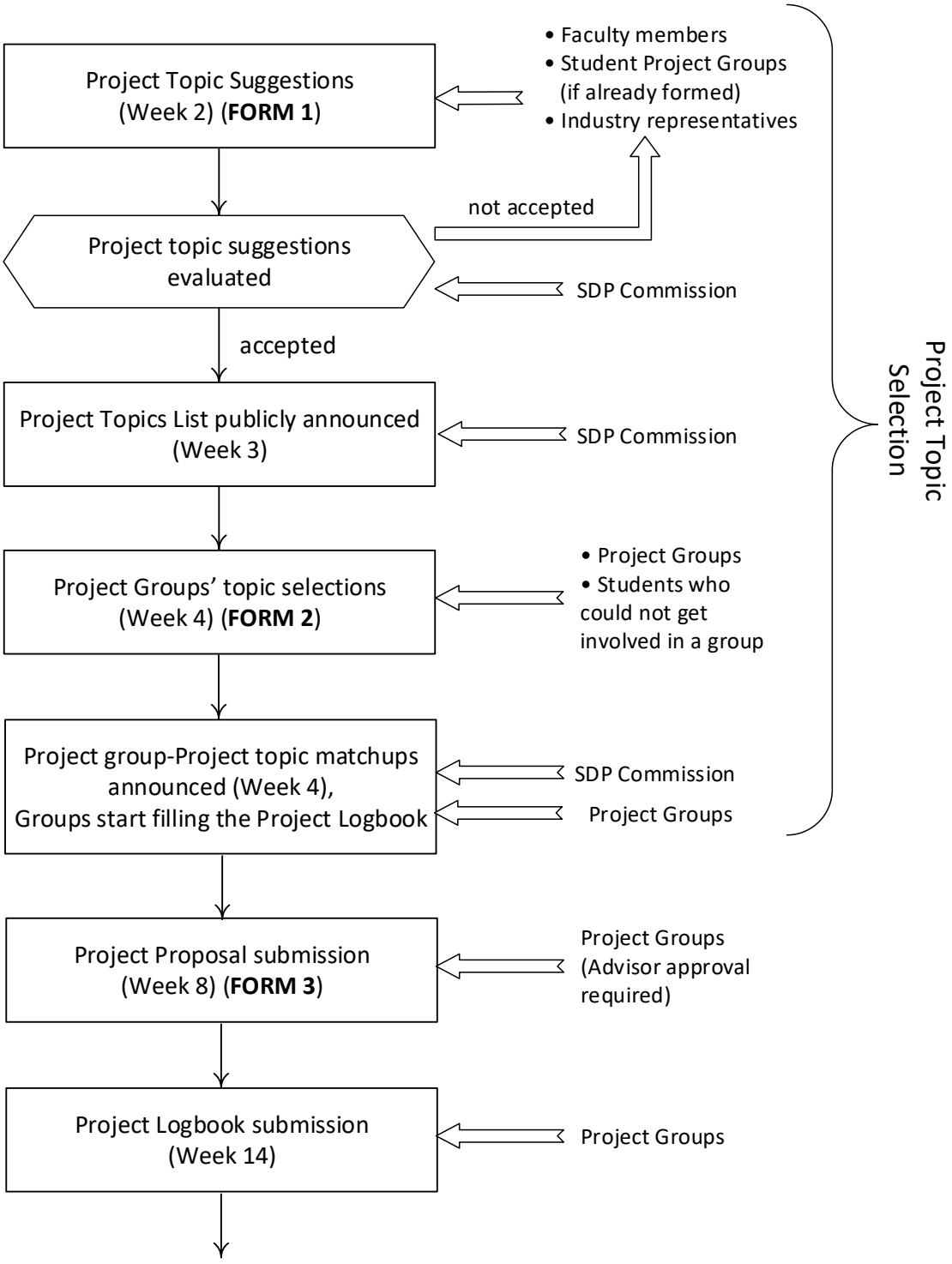
11. The SDP committee together with the department administration determines a SDP Poster Session time during the week of the oral presentation exams after the presentations are finished. All SDP project groups prepare and concurrently present their posters detailing the work they realized through the SDP process in a 2-3 hours long session.

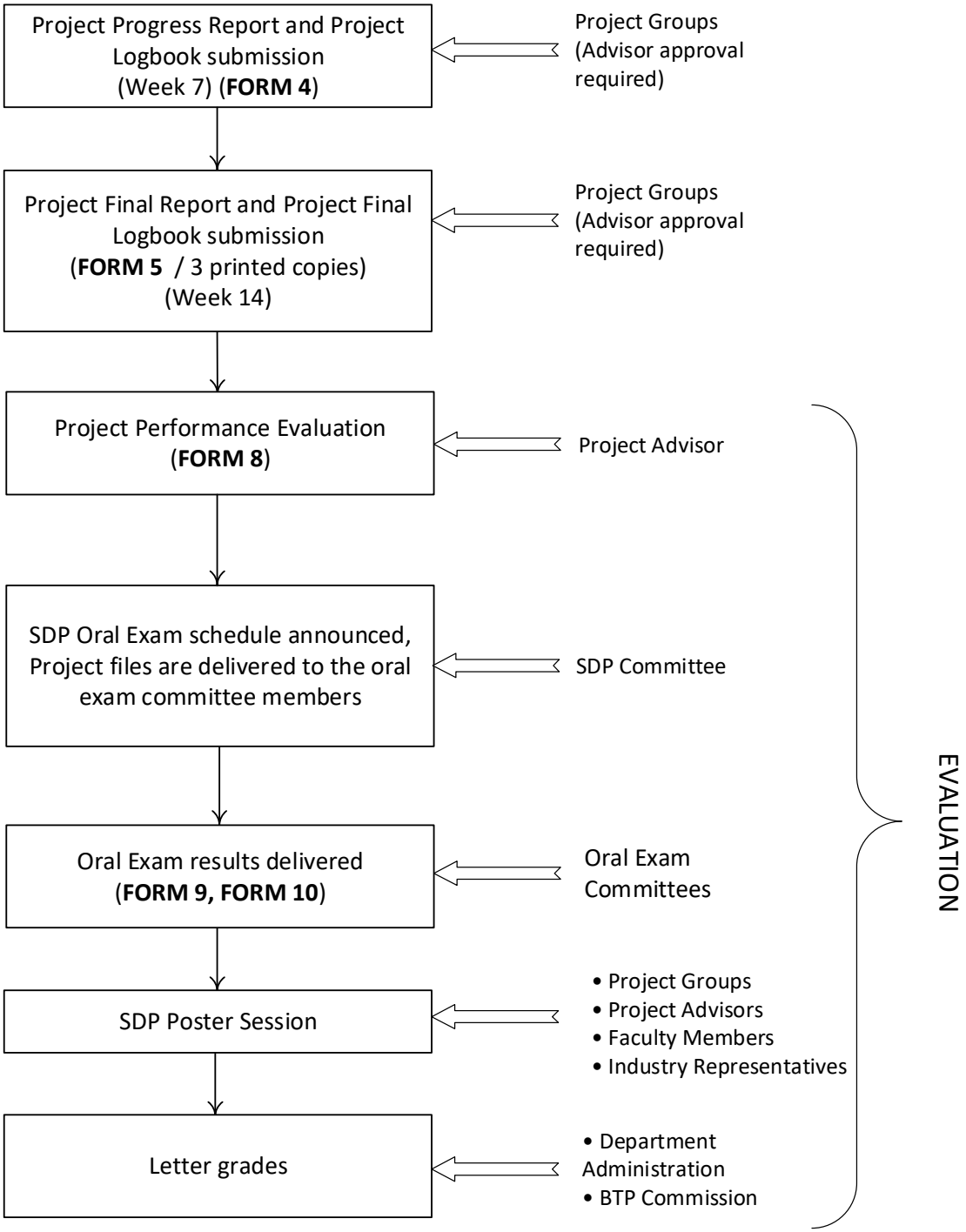
12. The department administration sends the results of the SDP Advisor-Group Evaluation Forms and the Oral Exam Evaluation Forms to the SDP committee. Final Grades consist 50% from the SDP Advisor-Group Evaluation as assigned by the SDP advisor and 50% from the Oral Exam Evaluation as assigned by the examination committee. These grades are converted to letter grades by evaluating all of the students enrolled in the particular SDP course. Letter grades are posted by the department administration.

VALIDITY

The stated ITU Electronics and Communication Engineering Department SDP Implementation Regulations are valid starting with the Spring semester of 2017-2018 academic year.

Semester 1


Project Topic Suggestions (Week 2) (FORM 1)
• Faculty members
• Student Project Groups (if already formed)
• Industry representatives
not accepted
Project topic suggestions evaluated
SDP Commission
accepted
Project Topics List publicly announced (Week 3)
SDP Commission
Project Groups' topic selections (Week 4) (FORM 2)
• Project Groups
• Students who could not get involved in a group
Project group-Project topic matchups announced (Week 4), Groups start filling the Project Logbook
SDP Commission
Project Groups
Project Proposal submission (Week 8) (FORM 3)
Project Groups (Advisor approval required)
Project Logbook submission (Week 14)
Project Groups
Project Topic Selection

Senior Design Project (SDP)

Semester 2