King Abdulaziz University
Faculty of Engineering
Department of Electrical and Computer Engineering

Guidelines for EE 499

SENIOR DESIGN PROJECT

Updated: January 2025

1. Course Structure

The EE 499 Senior Design Project (SDP) is a two-semester course named as **SDP Term 1** and **SDP Term 2**. Students will be working in SDP Teams under the guidance of SDP Advisors on design problems proposed by Customers. The SDP Advisors are faculty members of the Department of Electrical and Computer Engineering (ECE) that will guide the SDP Teams throughout these two terms. A Customer can be the team's SDP Advisor, another faculty member from the ECE department or any other department, or an industrial representative. The Customer only provides the necessary requirements of the end product. A Customer will not specify any approaches, methods, tools and devices to be used to solve the defined problem.

1.1 SDP Term 1 Tasks

- Students must form their own **SDP Team** and select a **Project Topic** and **SDP Advisor**. The students will start with forming their own SDP Team that consists of 2 or 3 members. The SDP Team can refer to a list of approved project proposals provided by the SDP Committee to help select the Project Topic and SDP Advisor. The SDP Team can also directly discuss different projects with faculty members and select them as advisors with the approval of the SDP Committee. The SDP advisor must submit an **SDP Team Formation Form** to officially register the EE 499 course.
- SDP students are requested to attend an orientation session about the SDP process, which includes SDP stages, deadlines and evaluations.
- The SDP team and SDP advisor are required to conduct frequent meetings with documented **Meeting Minutes** (minimum of 6 meetings).
- The SDP team under the guidance of the SDP advisor must collect **Background Information**, clearly **Define the Problem**, specify the **Project Objectives**, and determine the **Product Design Specifications** based on the customer's needs considering the realistic assumptions and constraints and meeting the prescribed engineering standards.
- The SDP team is required to conduct a comprehensive **Literature Review** about current technologies and previous designs and solutions that are relevant to the design problem.
- Based on the Literature Review, brain-storming sessions within the team and discussions with the SDP advisor, customer and other experts, the team must propose at least **Three Alternative Designs.** A design is considered an alternative if it uses a different approach. Each design should give the complete solution to the problem, from beginning to the end.
- The SDP team must thoroughly analyze these Alternative Designs using appropriate tools. Based on the analysis, the team will choose the best alternative design as the **Baseline Design**.
- All these tasks must be documented in the **SDP Term 1 Report**.

1.2 SDP Term 2 Tasks

- After the successful completion of SDP Term 1 (overall grade is more than 25%), a grade of "IP" in EE 499 will be registered for the student.
- The SDP team and SDP advisor are required to continue meeting with documented **Meeting Minutes** (minimum of 6 meetings).
- The SDP team continues with the Baseline Design developed in Term 1 and implements all the major parts of the final product (**Project Prototype**). The SDP team will go through the trial-and-error process until they achieve the **Final Technical Design** for the project after assembling all the major parts.
- The SDP team is also required to design and conduct **Validation Experiments** for testing the designed prototype and/or its major components to validate the Product Design Specifications.
- All these tasks must be documented in the **SDP Final (Term 2) Report**.

2. Student Outcomes

The ABET Student Outcomes (SOs) addressed by the SDP course are:

- **SO-1** Student's ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- **SO-2** Student's ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO-3** Student's ability to communicate effectively with a range of audiences.
- **SO-4** Student's 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.
- **SO-5** Student's 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.
- **SO-6** Student's ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- **SO-7** Student's ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

3. SDP Stages and Grade Calculation

The final grade is calculated based on the weights defined for each SDP evaluation stage. The evaluations will be performed by SDP advisors, SDP committee and/or ECE faculty members.

SDP Stage	Actions Required / Evaluation Elements	Grade Weight
SDP Registration	• Form SDP Team • Select Project Topic and SDP Advisor • SDP Advisor must submit SDP Team Formation Form	Tasks must be completed for the registration of EE 499
Identifying the Problem and Design Requirements	• Background • Problem Definition • Project Objectives • Project Design Specifications	5%
Conceptual Designs	• Literature Review • Alternative Designs • Baseline Design	8%
SDP Term 1 Report and Presentation	• SDP Term 1 Report and Presentation (15%) • Term 1 Advisor Evaluation (12%)	27%
End of Term 1		
Progress Update	• Update on implementation and preliminary results for validation experiments	5%
SDP Final Report and Presentation	• SDP Final (Term 2) Report (22%) • SDP Final (Term 2) Presentation and Prototype Demonstration (15%) • Term 2 Advisor Evaluation (18%)	55%
End of Term 2		

4. Penalties and Deductions

All SDP reports and presentations must be submitted and presented on time. No late submissions or presentations will be accepted and the grade for any missed evaluation will be **zero**. An exception may be granted through the SDP advisor and SDP committee with sufficient deduction (50%) of the grade.

A student will fail individually if:

- His overall grade is less than 25% by the end of Term 1.
- His overall grade is less than 50% by the end of Term 2.
- He is adversely reported by his SDP advisor, SDP committee or any SDP evaluator.

A student will be awarded an “IC” grade (and Term 3) if he scores 50% of the overall grade or more at the end of Term 2 but fails in any major component(s) of the project (engineering design, validation experiments, reports, presentations and prototype).