

BILGI Industrial Engineering

Senior Design Project Department Practices

This document summarizes the practices of BILGI Industrial Engineering Department on the Senior Design Project. The project calendar is described for a regular student for which the 7th semester is a fall semester, and 8th semester is the final spring semester. For irregular students, the calendar will be as similar as possible. Intended to aid the students as well as the faculty members, the document contains the following sections:

- 1. General Information**
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- 6. Evaluation of Projects**
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1. General Information

1.1 Senior Design Project

The Senior Design Project (SDP) is intended to be a capstone experience that is built on the previous three years of course work in your engineering curriculum. In the Industrial Engineering Program, SDP is administered through a two-semester course sequence, IE 490 & IE 491 and IE 492.

1.2 Resources

Faculty Resources

BILGI Faculty of Engineering and Natural Sciences website contains a wealth of resources on SDP, including SDP policy, SDP prescription, generic syllabus, progress report template, final report template and poster preparation guide.

Faculty website -> Forms and Documents -> For Students -> Senior Design Project

Department Resources

The main departmental resource for the Industrial Engineering program is the document you are viewing right now, which contains information on the basic SDP practices such as forming the teams, assigning the advisor and topic, evaluating the project output, etc. This document is available in the course website. In addition, the course syllabi for IE 490, IE 491 and IE 492 contain similar information in the standard syllabus format.

Another valuable resource is the set of three past project reports and their presentation slides, which were found to be successful in the previous semesters. These project sets will be available in the course websites for both IE 491 and IE 492.

1.3 IE SDP Calendar

The *IE SDP Calendar* is a template for all project activities highlighting the important steps and deadlines of SDP. The calendar contains slots for weekly signatures of the team members. The team is responsible to keep track of the signed calendar and submit to the advisor at the end of the semester.

1.4 Who is who?

IE 490/491/492 Coordinator

The role of the IE 490/491/492 coordinator is to facilitate the flawless organization and execution of the projects. The coordinator's main tasks include organizing informative meetings before 7th semester, assisting formation of project teams, maintaining the course website for announcements and timely execution of project stages (such as finalizing team-topic-advisor matches; collecting project proposals, progress reports, final reports, posters, presentations), entering the letter grades recommended by the examination committee, and archiving all project outputs. Currently the coordinator for IE 490/491/492 is Umman Mahir Yıldırım.

IE 490/491/492 Assistant

A student assistant helps the coordinator for archiving the project material.

Project Advisor

The role of the project advisor is to advise, guide and direct the students in a properly and timely manner from beginning to completion of the project. All IE faculty members, including the part time instructors, are potential advisors. See Section 2 (Before 7th Semester) on how the advisor-team matching is done.

Examination Committee

The examination committee includes all IE faculty members. At the end of both semesters, the committee evaluates the projects based on the oral presentations and project reports. For details of the evaluation, see Section 5, Evaluation of Projects.

2. Before 7th Semester

Prerequisites

The prerequisites for both IE 490 and IE 491 are IE 322, IE 341, IE 335. In addition, the students must have completed all courses from the first two years in order to be eligible to take IE 490/491.

Project Topic

Choosing a proper topic is perhaps the most important step towards a successful SDP. The topic must reflect the coursework in the Industrial Engineering Program, and the project output must be a system design addressing a complex engineering problem. We strongly advise the students to think about suitable topics in the earlier years of the program. There is no standard way of choosing a topic. In the past, we were happy to see that successful projects came from very different directions. Here are some examples:

- 1. Students bring a topic from the company/organization in which they did their summer practice.*
- 2. Students approach a company/organization in which they believe they can make a difference, and ask for a potential project topic.*
- 3. Students bring a topic from their family company.*
- 4. Students work on a problem of their own company/initiative.*
- 5. Students work on a research problem (role of advisor is very significant here, recommended for students planning to pursue an academic degree)*
- 6. Advisor has a contact in a company/organization.*
- 7. Advisor involves the team in a part of his/her research project.*
- 8. Many more...*

Forming the Teams

The coordinator sets a meeting with all 3rd year students in the spring semester, which is the 6th semester for a regular student. In this meeting, the SDP process is briefly explained, and students are asked to form teams by the end of the semester. Team size may vary from semester to semester. Currently, the teams are required to consist of five students. The students report the team members to the coordinator, along with a tentative topic.

Team-Topic Match

As indicated above, the teams formed in the 6th semester also specify a tentative project topic. This topic may change later on, no problem. Moreover, if a specific topic is not available, you may specify an *area* that you wish to work on. Your choice of topic/area helps us assign the proper advisor for your project. Choosing the topic in your 6th semester is very advantageous since you may start doing some early work with your advisor during the summer break before IE 491.

Assigning the Project Advisor

Once the team-topic/area list is complete by the last week of classes in the 6th semester, the coordinator sets a meeting with the Examination Committee to discuss the best possible allocation of advisors. After this meeting the coordinator immediately announces the *team-topic-advisor list*. This list is still not final since some students may not be eligible to take IE 491 in the fall semester. However, we aim to make very minor changes after this point. Teams are required to arrange a 6th semester meeting with their advisor.

Summer Break Before the Project

Teams and advisors are recommended to start brainstorming about the project during the summer break. A significant progress in the project proposal will help the team for a smooth start in the fall semester.

3. 7th Semester (IE 490)

With this course, the students are expected to gain an experience in conducting experiments, collecting data, analyzing the data, interpreting results and applying modern design methods for this purpose in a teamwork environment. These skills will help the students in their Senior Design Project which is intended to be a reflection of a three-year of educational and practical work that the students complete in their fields.

4. 7th Semester (IE 491)

Final Team-Topic-Advisor List

In the beginning of the 7th semester, the coordinator sets an IE faculty meeting in order to make the final adjustments on the team-topic-advisor list, only for the required cases. After this point, no changes are allowed for teams and advisors.

Project Proposal

A project proposal is intended to convince others that you have a worthwhile research project and that you have the competence and the work plan to complete it. Generally, a project proposal is a one-page document containing all the key elements involved in the research process such as the project name, team members, advisors, project description, main research question, proof of background for completing the promised tasks, time table, etc.

With the help of their advisors, all teams are required to submit a project proposal within the first four weeks of the 7th semester to the SDP coordinator. Changes in the topic are allowed at this point. The coordinator then sets an IE faculty meeting to evaluate the proposals. If a proposal is approved, the coordinator enters the team-topic-advisor details to SIS, and no further changes

are possible throughout the IE 491/492 sequence. If a project proposal is rejected, the team has two weeks to submit another proposal.

Project Proceeds

After the approval of the project proposal, teams may formally proceed with the project. Weekly team-advisor meetings are held, and signatures are collected in the *IE SDP Calendar*.

Advisor's Approval for Progress Report and Draft Presentation

On the last week of classes, teams submit a progress report and a draft presentation to their advisors. Once both documents are approved by the advisor, the coordinator schedules a presentation time for the team.

End of Semester Oral Presentation

By the end of the semester, the coordinator sets presentation sessions for all teams. This is typically two half days in the final exam week, and each team is given 15 minutes for presentation and five minutes for questions from the audience. All students are required to attend all presentations, attendance is taken. Teams upload their presentation materials on the course website.

Progress Report

Before coming to presentation session, teams upload their IE 491 progress reports to the course website, and submit one binded hard copy of the progress report to the coordinator during the session. Plastic binding is accepted only for IE 491.

Winter Break For Classes

Depending on the progress report, the advisor may assign additional tasks to the team, and schedule meetings during the winter break for classes.

5. 8th Semester (IE 492)

Project Proceeds

All successful IE 491 teams register for IE 492 in the next semester and proceed with the project with the same advisor and topic. Teams meet with their advisors on a weekly basis.

Advisor's Approval for Final Report, Draft Presentation, Draft Poster

On the last week of classes, teams submit the final report and a draft presentation to their advisors. Once both documents are approved by the advisor, the coordinator schedules a presentation time for the team.

Final Presentation

Just like IE 491, IE 492 concludes with presentation sessions and submission of final project reports. In IE 492, teams are allowed for 20 minutes for presentation and five minutes for questions.

Final Report

Before coming to presentation session, teams upload their IE 491 final reports to the course website, and submit one binded hard copy of the progress report to the coordinator during the session. Plastic binding is not accepted for IE 492, you need to submit a professional binded copy with the title page in the front cover. Talk to your advisors for binding details.

Poster

In addition to the presentation and final report, in IE 492 the teams are required to submit a poster. Bring your poster to the presentation session in electronic format.

6. Evaluation of Projects

The Examination Committee evaluates your project work based on your presentation and report, and gives you a letter grade. The committee uses the *IE SDP Evaluation Form* for evaluation, which judges the content of the project, presentation, and organization of the project report. The blank evaluation form will also be available for the students in the course website. Not every team member necessarily gets the same grade. Advisors may give peer evaluation forms to team members, in which students evaluate each other's performance. These peer reviews may contribute to your letter grade. Note that IE 490, IE 491 and IE 492 are 4, 5 and 9 credits respectively, so they have strong influence in your CGPA.

Top Projects

The Examination Committee ranks the projects, and the team with the highest score is asked to print their poster to be exhibited in the E-3 building for one year. The best project is also awarded a certificate.

7. Frequently Asked Questions

What are the prerequisites for IE 490 and IE 491?

IE 322, IE 341, IE 335. In addition, the students must have completed all courses from the first two years in order to be eligible to take IE 490 and IE 491.

Can I register for IE 490/491 and one of the prerequisites at the same semester?

No.

Can I take IE 490/491 in the spring semester and IE 492 in the fall semester?

Yes.

Can I take IE 490, 491 or 492 in the summer school?

IE 490/491 is not offered in the summer. Depending on the availability of the advisor and the team members, IE 492 may be offered in the summer.

Can the team members change at the beginning of 7th semester?

If necessary, small changes can be made when possible.

Do all the team members get the same letter grade?

No.

If one or more student fails in either IE 490 or IE 491, what happens to the remaining team member?

The passing team members register for IE 492 and complete the project. The failing ones register for IE 490 and/or IE 491 (depending on which is failed) the whole procedure starts all over.