DESIGN PROJECT DESCRIPTION OUTLINE

5% of course grade - Team Submission

Due:
• Friday, September 23, 2022 - 8pm EST on LEARN. Submit as a PDF Document.
• You must also email a copy to your project advisor, by the same due date.

Instructions

The Design Project Description lays the groundwork for the rest of your design process. It will explain:
·   what the problem space is, what possible problems are present, and what is the most important problem you intend to focus on and solve with your project,
·   why this problem is important, and
·   how you are currently proposing to solve this problem.

Excluding the title page, the document should be maximum 10 pages long, excluding citations. No appendices are allowed. Revise your draft as many times as necessary (i.e. start drafting it earlier rather than later) to produce a fluent and persuasive document. When writing your Design Project Description, keep in mind that your project advisor and the course instructor expect the same attention to research, analysis, and technical writing style that one would find in a professional report. While your immediate audience is your advisor and the course coordinator, the proposal should be understandable to others who are familiar with your field in general. Building on your previous design courses, and overall SYDE curriculum, the Design Project Description should contain only the following sections; recommended section lengths are given at the end of each section:

Introduction: Introduce the topic in a manner understandable by anyone with a technical background (i.e. any 1st year engineering student should be able to understand what problem solve you propose to work within). Provide the larger context for the problem space being addressed by the project.

  • (0.75-1 page)

Situation of Concern: Describe the situation of concern and illustrate how a variety of problems combine to create it. Provide a discussion of the relative importance of these various problems to each other, and connect these to impacts/effects these problems can have if they go unsolved. Ideally you have found a problem that causes many other problems in different domains or industries. This would be considered a high leverage problem.

  • (1 page)

Problem Focus: Identify the specific need or problem that your project will prioritize to have the largest impact on the problem space. Briefly discuss initially identified requirements and specifications of the problem you are solving. These will be further refined throughout the project, particularly through the Project Analysis stage.

- (0.5-1 page)

Needs Assessment and Prior Art: Identify why this is an important problem to address. You are looking for a problem with systemic effects, one that could significantly affect a large group of people, large organization, or industry. Affecting a smaller group of people, but in a more profound way, is also possible. Indicate why and to whom the problem is important, e.g., who are the primary and secondary users of your project outcomes. Background information should motivate the need for an engineering design approach to solving the problem. You must defensibly demonstrate the nature, extent, or significance of the problem you have defined. This can be done, for example, by identifying inadequacies in existing designs, demonstrating an industry need for such an implementation, or reviewing existing research or patents on the topic.

- (2 pages)

Ethical Implications of the Project: Discuss the social, environmental, and other ethical implications of your project. How would your solution positively affect society, who would it have a negative impact upon? What resources will your project use and what long term consequences will it have in terms of the local and global environment? What other ethical concerns will it be important to investigate and include in your design process (privacy, gender equality, animal rights, etc.)?
- (1 page)

Project Objectives and Outcomes: Objectives of your project must be specific and demonstrated to be realistic. You should discuss these with your project advisor. Questions to ask yourselves as you define your objectives are: are the objectives realistic within the time frame of the course? Realistic with respect to your group's capabilities and current level of experience? Indicate how the objectives will solve the identified problem.
- (1 page)

System Design Engineering Approach (concept generation, selection & testing) and Application of SYDE Curriculum:

Describe potential engineering analysis, design, and testing methods for requirements analysis, design selection, verification, validation, etc. (such as planned functional analysis, mathematical model analysis, simulation, user testing, etc.) to ensure that you have met (or have not met) your project requirements. As a SYDE capstone project, your Project Analysis and Initial Prototype (end of 461) and Final Project Outcomes (end of 462) will be assessed for its successful application of core SYDE analyses, modelling, and design skills and knowledge. Thus, you should clearly identify from which SYDE (or other TE) courses the proposed project methods draw.

- (2 pages)

Resource Management: Identify the resources you will need for your project, including people (advisors, technical staff, company mentor, user study participants, etc.) and their availability to your team, software resources (freeware, UW software, company-specific software) and its availability to your team, physical resources (specialized equipment, including tools, 3D printers, etc.) and its availability to your team. Identify potential risks involved in relying on these resources, and a potential mitigation plan (i.e. Plan B) if issues arise in gaining access to a planned resource OR if a planned resource does not have the capabilities you anticipate. Check the course outline for other important deliverable dates. BE REALISTIC for the timeline, budget, and use and availability of equipment/software resources you will need to achieve your project objectives and outcomes.

- (1 page)

References: Your Needs Assessment/Background and Prior Art must be based on solid academic / intellectual property assessment involving analysis of existing previous research, prior art and patents, as appropriate for your project. Refer to these sources in the main text and report the full sources, using appropriate, formal referencing style.

- (as required)

SYDE461
GRADING RUBRIC FOR PROJECT DESCRIPTION - TEAM

Group #:   Grader's name:

For each component, evaluators will consider the engineering content as well as the technical writing. Engineering content will be evaluated first.

Missing components = 0
U = Unsatisfactory (clearly below standard for a 4th year level SYDE student);
M = Marginal (meets minimum expectations);
S = Satisfactory (demonstrates basic competence for the project undertaken);
VG = Very Good;
E = Excellent;
O = Outstanding.

Feel free to provide intermediary values not present in the table.

Components	U	M	S	VG	E	O	Score
Introduction	0,5	1,5	2		3		
Situation of Concern	1	2,5	3	3,5	4	5	
Problem Focus	1	2,5	3	3,5	4	5	
Needs Assessment and Prior Art	2	5	6	7,5	8,5	10	
Ethical Implications of the Project	1	2,5	3	3,5	4	5	
Project Objectives and Outcomes	1	2,5	3	3,5	4	5	
System Design/Engineering Approach	1	2,5	3	3,5	4	5	
Resource Management	1	2,5	3	3,5	4	5	
References	1	2,5	3	3,5	4	5	
TOTAL out of 48							

See the sections above for guidance on what to include.