

STANDARDS FOR SDSU EE GRADUATE PAPERS (April 2002)

This document outlines the standards by which M.S.E. final papers should be evaluated.

A note to the student: DO NOT ASSUME ANYTHING. If you are in doubt as to whether your project or paper meets the guidelines outlined below, talk to your Major Advisor.

A note to Major Advisors: The student should select his/her advisory committee immediately after you agree to become the student's Major Advisor. You should convene a brief advisory committee meeting (which can be done via email) in which you propose a project plan and timetable, and all committee members must come to an agreement on its appropriateness and content. Doing this early in the student's career is an easy way to avoid difficulties later on. If a significant alteration in the student's plans becomes necessary, consult with the advisory committee. Bear in mind that the Major Advisor only has the authority to convene the committee and to make technical decisions regarding the daily operations of the project and its finer details. Deviations from the proposed plan of work, timetable, or plan of study must be approved by the advisory committee. When in doubt, consult with the Graduate Coordinator.

Thesis

Theses are significant works that contain a substantial body of original work. The following statements describe a thesis.

- 1.) The defining characteristic of a thesis is an original contribution to its field of study. A thesis must propose a new device, system, process, or other novelty. It is up to the writer of the thesis to prove the novelty of the contents of his/her thesis. If there is doubt, the student's advisory committee should be consulted. One metric that can be applied: if the work is publishable in a journal, it probably constitutes a thesis. If not, one of the other two types of paper should be considered.
- 2.) The thesis must contain a thorough literature search that shows the current state of the art; establishes the novelty of the idea presented; and demonstrates the need that is to be met by the new contribution.
- 3.) The thesis must clearly describe the development and underlying principles behind the new idea.
- 4.) The thesis must present experimental or other evidence that the new idea is feasible, and that it meets the need established in the literature search.

Design paper

Design papers detail the execution of the design process as applied to a particular design subject. The design subject can be a device, a system, a process, an algorithm, or software. The Advisory Committee determines the appropriateness of a design subject. The design subject need not be novel. This differentiates a design paper from a thesis. The following statements describe a design paper.

- 1.) A design paper must describe the execution of the elements of the design process, including: a) the definition of the project; b) specifications to be met by the design; c) brief discussions of the technologies used in the design; d) all relevant calculations; e) verification of proper operation of the design; and f) conclusions.
- 2.) The paper must contain a literature search detailing the state of the art of the device or system under consideration; the need being filled by the design presented in the paper; and evidence that the design presented in the paper is not readily available from another source. It is the responsibility of the author (student) to establish that these criteria are met.

Research paper

A research paper can be described as an extended literature search and synthesis of the literature for the purpose of answering a research question. Examples of research papers would include case studies, cost-benefit analyses, and analytical comparisons of options. The purpose of a research paper is to demonstrate that the author is able to use engineering knowledge to synthesize or analyze information from the literature in formulating an answer to the research question. A research paper is distinguished from a thesis by its scope, time requirements, and the absence of lab work. The following statements describe a research paper.

- 1.) It must pose a research question. This question must be one that is of current interest, and does not have a readily available answer from another source. It is up to the writer of the paper to justify that the question meets these criteria.
- 2.) It must use the current literature and available knowledge in order to answer the research question. The goal of the literature search is for the student to gain sufficient expertise to be able to pose an informed and supported answer to the research question. Research papers must therefore contain a thorough literature search, but an extended literature search by itself does not constitute a research paper.
- 3.) The paper must propose an answer to the research question based on what was learned in the literature search.