INSTRUCTIONS FOR THE PRIOR ART REPORT

The Prior Art Report documents your search of the prior art (science and technology) related to your design problem, either directly or indirectly. Your prior art search should have a distinct purpose, and the report contents should continually reflect that purpose. Your reasons for conducting the search will include one or more of the following:

1. To stimulate your thinking about solutions to your design problem
2. To improve upon existing designs
3. To see how your preliminary design ideas relate to the latest technology
4. To identify parts of existing designs that may work for your project.

State clearly and narrowly your purpose for conducting the search, and then write the report to be consistent with that purpose. Stated differently, do not select and describe a random number of articles or patents for discussion without telling how they came to be selected or how they might help you meet your design project goals.

Report Format

Use the template for memo-style reports on Canvas as a guide to the layout of this report. Your final document should be anywhere from 6 to 10 pages—with extra space allowed for figures, tables, references, and any appendixes—depending on the complexity of your design or the purpose of your search.

Prior Art and Patents

Professional engineers conduct exhaustive prior art searches not only to honor the intellectual property of others but also to stimulate ideas for advancing the technology (not to speak of their careers). Likewise, by seeing what others have done, you can gain insights into what you can do differently and maybe better. Be aware, however, that you gain the most from a prior-art search if you begin it early in the project and if you continue to search off and on as your design develops.

Definition of Prior Art

Prior art is everything publicly known, written, or demonstrated about solutions to your design problem or their components. If you can find no description of a product that addresses your problem, then your eventual design may be patentable. On the other hand, if such a product has already been described in the prior art, you cannot claim exclusive rights to its commercial use.

Patents represent a special class of prior art. A patent search establishes with legal certainty whether a product has already been patented, and if it has, you are probably redesigning a product that already exists. Your design solution is patentable only if it meets the following tests: (1) your design is unique and original; there is nothing precisely like it in the prior art; (2) as perceived by professionals skilled in the technical area, your design represents a non-obvious solution to a technical problem; and (3) your design is a true innovation; that is, it is more than a simple alteration in size or material.

Sources of Information

Typical sources of prior-art information include the scientific and technical literature searched via online library indices such as the *Engineering Index, Compendex,* and *INSPEC*; industrial catalogs, data sheets, trade publications, and other product technical material from manufacturers; and descriptions in the documentation of granted patents and patent applications. Sources for your patent search include the U.S. Patent and Trademark Office (USPTO; http://www.uspto.gov), Google Patents, and the European Patent Office (http://ep.espacenet. com). You can receive valuable assistance in your prior art search from the personnel at the Engineering Library.

Not all prior art is searchable. For example, some information is company proprietary, and information from the Department of Defense may be unavailable, secret, or heavily edited for public release; however, most other government-funded research publications are available to the public. Note that *a Google* or *Google Scholar* search alone is not enough.

Outline of Content

The following is an outline of the Prior Art Report, along with additional information describing the purpose and contents of each section. Though the first-level headings given below (THOSE IN ALL CAPS) are mandatory, feel free to add appropriate subheadings where needed to increase the accessibility of the report. NOTE: A general template for the reports is posted on Canvas. In the following outline, add or substitute subheadings as required for your particular project. Contents of the report are as follows:

[The standard memo heading. This memo heading, which is shown in the template, must be followed exactly. See also the first few paragraphs under Instructions for Memo-Style Reports in the Course Guide. For other formatting requirements, see General Style Guide for All Written Reports.]

INTRODUCTION

Follow the general outline of a strong introduction (document purpose, document context, and summary of document contents)

OVERVIEW OF THE DESIGN PROBLEM

Provide a brief overview of the design project, including the problem definition, customer needs, and target design functionality. This section is essentially a digested version of your original *Problem Statement*, meant for any reader who has not read that document or may not remember its ideas. You should get used to providing summary descriptions of any project you work on as an engineer.

REVIEW OF PRIOR ART

In this section, describe your search of the prior art relevant to your design problem and why it is significant in your case. Divide the section into two subsections: Prior Art Exclusive of Patent Information, and Patent Search and

Findings. Be sure to outline the significant similarities and differences between the prior art and any "black box" solution you must design.

Prior Art Exclusive of Patent Information

Although patents *are* considered prior art, your focus in this subsection is on *other* sources of information. Describe the procedures of your prior-art search and, for each item of prior art you discover,

- Identify the prior art clearly (e.g., by some combination of title, author, or source). Use IEEE style for text citations and references.
- Briefly summarize the prior art, and compare it with your own design needs or requirements

Patent Search and Findings

In this subsection, describe the portion of your prior-art search that focused on patents that could provide a complete or partial solution to your design problem. Follow the similar content instructions as in the previous subsection.

IMPACT OF PRIOR-ART SEARCH ON DESIGN DECISION-MAKING

Analyze what your design team can do with this information. Your job is here not necessarily to present a selected design but to present the team's analysis of the information produced in the prior art research. Tell the reader exactly how your search has affected your thinking about your design.

CONCLUSION

Briefly review the contents of this report for a manager who may read nothing else by providing a short summary of main ideas, presented in a way that reflects the purpose of this document. Be sure to make clear what this information means for your project as well as a clear indication of what comes next.

REFERENCES

List all sources you have cited in this report, including the patents themselves. The quality and number of items listed can be evidence of a sound and thorough search. List the references in the same numbered order as they are cited in the text. Each listing must appear in IEEE format. Remember to cite sources of material taken from the Web and other electronic sources.

IMPORTANT: Plagiarism in a written report will be severely penalized. If the plagiarism is blatant or extensive, your report will not receive a grade. All ideas you borrow from other sources must be cited in the text and listed on a reference page according to IEEE standards. If you repeat the wording of another author, you must both insert quotation marks and cite your source.