

# **Boise State University Department of Civil Engineering Guidelines for Writing a Thesis Proposal for the Master of Science in Civil Engineering Degree**

## **OVERVIEW**

The primary goal of the thesis or project proposal is to answer several questions about the work a student plans to complete. These questions include:

- **What is the hypothesis?**
- **Why is the proposed work interesting or important?**
- **How will your thesis research address the stated hypothesis?**

The proposal is written after consultation with your major advisor, review of the pertinent literature, and possibly completion of some preliminary experiments. The length of the proposal will be approximately 5-10 pages, excluding figures and references. The proposal should be well organized (see suggested outline below), and carefully written with complete sentences and fully developed paragraphs. References may be done in any format consistent with current civil engineering literature (see attached example). Much of the proposal may be used directly in your thesis, therefore writing a well-crafted proposal serves two purposes – planning your study *and* completing your final document.

The Boise State University Graduate College defines a thesis as follows:

Independent research activity that includes the clear statement of a hypothesis or proposition, a comprehensive review of the relevant literature, the collection and analysis of data and scholarly evidence, critical examination of the hypothesis or proposition in light of the data and evidence, and the production of a document that describes the study and its results in clear and effective English and conforms to the standards of the Graduate College.

The Department of Civil Engineering's preferred source for guidance on style and writing is *A Guide to Writing as an Engineer*, by David Beer and David McMurrey (2004), published by John Wiley and Sons (ISBN: 0471430749). You may find other resources on writing theses useful as well, such as David Holtom and Elizabeth Fisher's (2000) *Enjoy Writing your Science Thesis or Dissertation!* published by Imperial College Press (ISBN: 1860942075). There are also a number of books on this subject in Albertson's Library.

## **SUGGESTED PROPOSAL OUTLINE**

### **Abstract:**

The abstract is a concisely written summary of the project (less than a page in length) that includes the hypothesis statement, a brief discussion of background information, scope and

objectives of the proposed work, methods to be used, expected results, and the study's significance.

**Introduction:**

The introduction begins with a general discussion of the topic area and then a statement of your specific hypothesis. The significance of the question(s) to be addressed and the impact the proposed work will have on these questions should be addressed. A short statement about how the rest of the proposal is organized is sometimes included in this section.

**Scope:**

This section describes what work will be done (and what will not be done). Also, the goals and the objectives of the work to be performed may be described in this section.

**Background Section:**

In this section, provide the background theory and information needed to solve your problem. This section demonstrates to your committee that you fully understand the subject matter and are competent to undertake the proposed study. Writing this section also helps you solidify your understanding of the underlying principles and theories associated with your topic.

**Literature Review:**

Provide a review of the literature that gives an overview of the topic and describes the proposed study in the context of what is already known, and what is not known about the topic. This section should include references from the seminal work in the field as well as the most recent research results related to your project. Journal articles will likely be the most common source you cite in this section. This section should convince the reader that more research or study is necessary.

**Materials and Methods:**

This section describes the materials and experimental/numerical methods you will use to complete your study, including a complete explanation of the methods of data collection, experimental set-ups, analysis methods, and statistical tools that will be used to analyze the data. Include a detailed description of all of the major steps of the study, the assumption you will make, and the limitations of the methods you will use.

**Expected Results:**

Include a detailed discussion of any calculations or experiments you have already completed, as well as what new results are expected from your proposed study in this section. Restate the significance of the proposed work here.

**Work Plan/Timetable:**

This section includes a timetable predicting the duration of each step, including completion dates for each major step until you graduate. The plan will likely need modification, but establishing a plan from the outset can help identify potential problems and help you manage your time more effectively.

### Required Resources:

This section lists the resources needed to complete the thesis or project work (equipment, supplies, etc.) and the potential sources of equipment and funding.

### References:

References should be cited in the text as author's last name (or the organization's name, if no author is given) and year. Examples: *The velocity was 2.3 cm/sec (Jones, 2002), or Jones (1999) found that the velocity was 2.3 cm/sec.* If the author is unknown, cite the corporation or agency: *The maximum contaminant level for gribbium is 5 mg/l (EPA, 1999).* Figures taken from the internet or other sources must also be referenced with the author's last name (or the organization) and date, and then listed in the bibliography. If an author or organization has two references from the same year, label them (Jones, 2000a) and (Jones, 2000b). See the Bazant reference in the sample bibliography below. Do not list references that were not cited in the text.

The list of references should be listed alphabetically and formatted as shown below. Note: type of reference given in bold will not appear in your list – they are presented here for your information only.

### Example Bibliography

Affleck, S. (2004). Personal communication. **Personal communication (written or oral)**

Hibbit, M., J. Karlsson, and R. I. Pawtucket (1996). *ABAQUS user's manual – version 5.6*, 56 pgs. **Software users' manual**

Agarwal, V.C., and R. Mishra (2000). "Discussion of 'Design of pipelines to transport neutrally buoyant capsules,' by Prabhata K. Swamee." *Journal of Hydraulic Engineering*, ASCE, 126(1), 91-92. **Discussion of a journal article**

ASTM (1997). "Standard test method for electrical indication of concrete's ability to resist chloride ion penetration." *C1202-97*, West Conshohocken, Pa. **ASTM standard**

Bazant, Z.P., and D. Novák (2000a). "Probabilistic nonlocal theory for quasibrittle fracture initiation and size effect. I: Theory," *Journal of Engineering Mechanics*, ASCE, 126(2), 166-174. **Journal article**

Bazant, Z.P., and D. Novák (2000b). "Probabilistic nonlocal theory for quasibrittle fracture initiation and size effect. II: Theory," *Journal of Engineering Mechanics*, ASCE, 126(2), 175-185. **Second journal article by same authors in the same year**

Duvant, G., and J.L. Lions (1972). *Les inéquations en mécanique et en physique*, Dunod, Paris (in French), 150 pgs. **Book**

Eshenaur, S.R., J.M. Kulicki, and D.R. Mertz (1991). "Retrofitting distortion-induced fatigue cracking of non-composite steel girder-floorbeam-stringer bridges." *Proceedings of the 8<sup>th</sup>*

*Annual International Bridge Conference*, Engineers' Society of Western Pennsylvania, Pittsburgh, Pa., 380-388. **Conference proceedings**

"Factory liability limits backed" (2000), *Washington Post*, Feb. 3, A7. **Newspaper article**

Federal Highway Administration (FHWA) (1995). "Fly ash facts for highway engineers." *Report No. FHWA-SA-94-081*, Washington, D.C, 36 pgs. **Report authored by an agency**

*Federal Register* (1968). 33 (No. 146; July 27), 10756. **Federal register entry**

Gupta, A., and H. Krawinkler (1999). "Seismic demands for performance evaluation of steel moment resisting frame structures." *John A. Blume Earthquake Engineering Center Report No.132*, Department of Civil Engineering, Stanford University, Stanford, Ca, 40 pgs. **University report**

Hordijk, D. A. (1991). "Local approach to fatigue of concrete." PhD thesis, Division of Structural Engineering, Luleå University of Technology, Luleå, Sweden, 430 pgs. **PhD thesis**

International Conference of Building Officials (ICBO) (1997). *Uniform building code*, Whittier, Ca, 500 pgs. **Book by organization**

Melan, J. (1913). *Theory of arches and suspension bridges*, D.B. Steinman, translator, Myron C. Clark, Chicago, Ill, 111 pgs. **Book**

Merifield, R.S., W. W. Sloan, and H. S. Yu (1999). "Rigorous plasticity solutions for the bearing capacity of two-layered clays," *Géotechnique*, London, 49(4), 471-490. **Journal article**

"Product overview" (1999). <<http://in-site.bidcom.com.html/overview.html>> (Accessed Feb. 3, 2000). **Product literature**

*Soil survey of Acadia Parish, Louisiana* (1995). Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C., 40 pgs. **Soil survey report**

USGS (1990). "Site report," Internet: <http://example.com>. Accessed 2/16/03. **Website (give the date you accessed the site)**

Zadeh, L.A. (1981). "Possibility theory and soft data analysis." *Mathematical frontiers of the social and policy sciences*, L. Cobb and R.M. Thrall, eds., Westview, Boulder, Co., 69-129. **Chapter in an edited book**

Zhang, H. M. (2000). "Phase transitions in nonequilibrium traffic theory." *Journal of Transportation Engineering*, ASCE, 126(1), 1-12. **Journal article**

### **Figures and Tables:**

Figures should be clearly drawn, informative, and accompanied by informative captions and

incorporated into the text immediately after they are cited. Every figure and table should be referred to by its proper number (for example: “See Figure 1 (or Table 1)” not “See figure (or table) below”). A numbered figure is always capitalized (Figure 1 (or Table 1)”, not “figure 1 (or table 1)”). You may wish to include maps of study areas or schematics of experimental setups as figures in the body of your proposal.

#### **CRITERIA FOR EVALUATION OF A THESIS OR PROJECT PROPOSAL**

Your thesis proposal will be evaluated by your advisor and graduate committee on the basis of:

- Technical merit
- Contextual relevance to existing subject knowledge
- Clarity and conciseness

#### **FOR MORE INFORMATION**

Talk to your advisor, or contact the Departmental Graduate Coordinator.

#### **ACKNOWLEDGEMENTS**

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