

# Proseminar

## Guide

Department of Mathematics & Statistics  
University of West Florida

December 2006

## **Preamble**

The following pages constitute a guide to students and their advisors with regard to proseminars in the Department of Mathematics and Statistics. The aim is to provide broad guidelines for successful execution of this vital component of the student's educational journey. It is also the aim to articulate departmental expectations and minimum standards while enhancing student success. In addition, we hope to achieve some semblance of uniformity in the product without stifling individual creativity.

## **What Is A Proseminar?**

The Proseminar is an independent research project undertaken by the student in partial fulfillment of the requirements of a degree in the Department of Mathematics and Statistics. It is required of all undergraduate students as well as those master's level students who elect not to do a full master's thesis. The research project is done under the active advice and close supervision of a faculty member. While the nature of the research could be expository especially for undergraduate students, the subject matter is expected to be non-routine and several notches above the material usually discussed in regular (non-seminar) courses at the level in question. Graduate students are strongly encouraged to inject an exploratory dimension that attempts to add to the body of knowledge in the chosen field. We see the proseminar as an activity for faculty to engage students in active learning. We shall utilize learning outcomes from the Project Management Domain.

## **Student Learning Outcomes**

After taking various advanced courses in Mathematics and/or Statistics, the student is then exposed to this independent research as an enrichment in which he/she is expected to gain a combination of specific skills to include:

- Selecting and defining a realistic problem to be solved.
- Identifying multiple relevant resources of literature.
- Integrating mathematical/statistical concepts appropriately.
- Coherently presenting technical material in written form, using one of formats for the standard scientific journals.
- Making valid suggestions for improvement or further study.
- Effectively presenting results orally.
- Managing time appropriately in oral presentation.
- Responding effectively to constructive feedback.
- Executing project objectives timely.
- Delivering acceptable product on time.

## **The Process**

The following steps are to be taken in order to complete this requirement:

- Student chooses a proseminar advisor, usually among the Department faculty.
- Student chooses a topic of interest and obtains advisor's approval.
- Student formally registers for the Proseminar [the Department Academic Advisor grants permission].
- Student proceeds with research on chosen topic, meeting with the proseminar advisor at agreed times.
- Student submits an electronic copy of written report to the Department Office Administrator. The Proseminar Committee grades the report.
- Student makes a 15-20 minute oral presentation to the Department [dates are published each semester]. The Proseminar Committee grades the oral presentation.
- Student submits 2 final copies [1 electronic, 1 hard copy] of written report to the department [Office Administrator].
- Proseminar Committee, in consultation with proseminar advisor, recommends satisfactory/unsatisfactory proseminar grade to the department.

## **The Two Components of A Proseminar**

There are two distinct components of the proseminar: a written report and an oral presentation. The written report should necessarily focus on the mathematical and/or statistical utility, development, or connections with respect to the problem under study. It should be devoid of needlessly complicated excerpts culled from other sources. Such excerpts, if deemed necessary for the project, may be included in the appendices for self-containment, completeness, or ready reference. Of course, we expect that the report be written in good grammar, too. The oral presentation is simply a different format for presenting the research work. It should aim at painting a good picture of the researcher's results within a rather short timeframe. In this regard, the presenter should strike a good balance in the presentation by avoiding grave details of massive calculations while highlighting pivotal elements of the work done.

## **The Written Report**

The written report should follow the broad subheadings provided on the sample Table of Contents page. See Appendix A. It is expected that the written report be at least ten pages long, typed double-spaced. Slight deviations to this format are left to the judgment of the Proseminar Advisor.

A good *Introduction* defines the problem under consideration in concise and succinct fashion without ambiguity. It also highlights the importance or relevance of the problem to provide some rationale or motivation for the study. An attempt should be made to inform the reader about the focus and thrust in order to give a context to the research. While the *Introduction* serves as an invitation to read the rest of the report, it is also an opportunity for the researcher to put the direction of the research effort in perspective, leaving no false expectations to the reader. A review of the literature regarding the problem should be documented with appropriate references, as opposed to a complete bibliography. It should document the existing background information (related theories and theorems, results of experiments, axioms, etc.) that forms the foundation for the main work. If the literature review is voluminous, it could form a separate chapter.

The *Main Body* of the written report should contain the major part of the student's research. It should be organized in appropriate subheadings to clearly distinguish between and among components of the work.

The *Conclusion* should include a summary of the results as well as any conclusions that may be drawn from the project as a whole. The researcher should also point to possible directions of further study of the problem. Furthermore, the researcher's personal thoughts, opinion, and conjectures on the subject, based mainly on the new experience, could also be included in this section.

Samples of the different elements of the required format for the written report are included in this Guide:

- Appendix B. Sample Cover Page – Bachelor's Degree
- Appendix C. Sample Cover Page – Master's Degree
- Appendix D. Sample Approval Page
- Appendix E. Sample References

### **The Oral Presentation**

Students will be allowed 15 to 20 minutes each to make an oral presentation of their proseminar. Students should prepare PowerPoint, slides, overhead transparencies, or any advisor-approved visual aids to help them make their presentations effectively. A good presentation should be such that it is readily understandable by classmates, regardless of the complexity of the problem [i.e. oral presentations should pass the classmate test]. The essence is to communicate the student's research in a medium similar to a professional conference.

### **Assessing The Proseminar**

The Proseminar Committee comprising three department faculty members will grade the written report and the oral presentation. The written report weighs 60 points, the oral presentation weighs 30 points, and time management weighs 10 points.

The research project will be graded according to the assigned weights in the following student learning outcomes (SLO):

### **Weighted SLO**

Here, [W] stands for Written Report, [O] is Oral Presentation, and [T] is Time Management.

- Selecting and defining a realistic problem to be solved [10 points W].
- Identifying multiple relevant resources of literature [10 W].
- Integrating mathematical/statistical concepts appropriately [15 W].
- Coherently presenting technical material in written form, using one of formats for the standard scientific journals [15 W].
- Making valid suggestions for improvement or further study [10 W].
- Effectively presenting results orally [20 O]\*.
- Managing time appropriately in oral presentation [5 O].
- Responding effectively to constructive feedback [5 O].
- Executing project objectives in time [5 T].
- Delivering acceptable product on time [5 T].

\*Note that "Effective Oral Presentation" will be scored according to:

- Clarity – 4 points.
- Substance – 8 points.
- Apparent command of subject matter – 8 points

### **General TIPS for A Successful Proseminar**

The following is an incomplete list of suggestions that should help the student in the proseminar:

- **Start early.** Choose your proseminar advisor and discuss your plans during the term before your graduating semester. Ideally, you should gather information on your topic between semesters. Your graduating semester can be hectic in ways you may not anticipate *a priori*.
- **Be productive.** Don't visit your advisor empty-handed with the hope of getting something. Bring what you have EARLY and OFTEN, then ask as many questions as you find necessary. Your advisor is on your side but cannot guide you in a vacuum!
- **First draft!** A typed first draft is a critical tangible piece that your advisor will use to hold a meaningful discussion about your project. Count yourself as being behind if you don't have a first draft by the 9<sup>th</sup> week of a regular semester (7<sup>th</sup> week of Summer session).
- **Help.** If you have a draft by midterm, the Proseminar Committee may proofread it and give you helpful input.
- **Appendices vs. References.** If there is an existing result that is fairly central to completing your project objectives, you may place it in the Appendices and also note it in the References. If you do not use a related source of which you are aware, then you need not reference it.
- **Prepare the Talk.** Assemble visual aids for your oral presentation soon after your advisor is satisfied with the content of your research. This can be prior to completing the edits for the written report. PRACTICE and time your presentation [alone, before friends, before your advisor] and get feedback. Adjust your aids accordingly.
- **Take charge!** Plan to give a "good talk" by design. Be well rested the night before; dress professionally to your big day. During your presentation, connect with your audience; avoid reading from index/cue cards; avoid reading mathematical equations; be composed and confident; be in command . . . because you did the work!

**N.B.** *This Guide will be revised as often as the Department sees the need. Students' suggestions for improvement to the Guide are strongly encouraged. It is the student's responsibility to ask the Department Academic Advisor for the latest edition.*

**APPENDIX A. Sample Table of Contents Page**

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Note: *Fields printed in bold above are required.*

**APPENDIX B. Sample Cover Page – B.S.**

# **Mathematical Modeling of the Heat Equation**

By

John Adam Smith

Advisor: Dr. Ralph Karr

An Undergraduate Proseminar  
In Partial Fulfillment of the Degree of  
Bachelor of Science in Mathematical Sciences  
The University of West Florida  
December 2006



**APPENDIX C. Sample Cover Page – M.S.**

# **Mathematical Modeling of the Heat Equation**

By

John Adam Smith  
B.S. (Physics), Univ. of Illinois, 2004

Advisor: Dr. Ralph Karr

A Graduate Proseminar  
In Partial Fulfillment of the Degree of  
Master of Science in Mathematical Sciences  
The University of West Florida  
December 2006

**APPENDIX D. Sample Approval Page**

The Proseminar of John Adam Smith is approved:

\_\_\_\_\_  
Ralph Karr, Ph.D., Proseminar Advisor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Mary J. Hardwork, Ed.D., Proseminar Committee Chair

\_\_\_\_\_  
Date

Accepted for the Department:

\_\_\_\_\_  
James Dogood, Ph.D., Chair

\_\_\_\_\_  
Date

## **APPENDIX E. Sample References**

Here is a Sample Paragraph:

It is well known [1] that the heat equation is a good representation of reaction-diffusion processes. Although there are several real-world applications of the heat equation, we are primarily interested in the connections between reaction-diffusion and heartbeat. Krinsky et al. [2] have studied these processes extensively as they relate to irregular heartbeat. In fact, their results are now widely used in medical research and applications. In its simplest form, the one-dimensional heat equation is given by

$$U_t = U_{xx}; \quad (1)$$

where  $t$  is time and  $x$  is a space variable. Mahoney [3] asserts that atmospheric temperature changes can also be explained using the heat equation.

### **References**

- [1] Grindrod, P. *Patterns and Waves: The Theory and Applications of Reaction-Diffusion Equations*. Oxford, UK: Clarendon Press, 1991.
- [2] Krinsky, V.I., Biktashev, V.N., Pertsov, A.M. Autowave approaches to cessation of reentrant arrhythmias. *Annals of the New York Academy of Sciences* 1990; 591: 232-246.
- [3] Mahoney, M.J. (2005). A Discussion of Various Measures of Altitude. Retrieved June 9, 2005 from the NASA Jet Propulsion Laboratory, Microwave Temperature Profiler website: <http://mtp.jpl.nasa.gov/notes/altitude/altitude.html>

Note: [1] is a book, [2] is a journal article and [3] is a web citation.