

## **Research Proposal Guidelines**

### **General Purpose**

The purpose of a proposal is to sell your idea to a funding agency. Your goal in writing the proposal is to convince the agency that you have identified a problem that is significant and worth studying, that the approach you plan to use to solve the problem is novel and likely to produce new data/insights/techniques, and that you are capable of accomplishing the goals that you have set out in your methodology.

### **Parts of a Proposal**

#### **Title and Abstract**

You will need to prepare an abstract for your presentation one week before your scheduled time and place it in each faculty member's mailbox. The abstract should include the title, time and place of the seminar along with a one page summary of the presentation to be given.

The title and abstract should capture the essence of your proposal. The title should be brief, scientifically valid, intelligible to a scientifically literate reader, and suitable to a public announcement. They should be informative, succinct, and offer specific details about the educational issue, variables, context, and proposed methods of the study. Abstracts will typically be in the 100-200 word range.

#### **Introduction**

The introduction should clearly present the problem that you have selected, why this problem is significant to the scientific community, and (briefly) explain how you plan to investigate this problem.

#### **Background**

The background (or literature review) should adequately place your stated problem and methods in context of the most recent and relevant studies on the subject. You are trying to inform the audience of where your work fits into the stated problem and why your work should be done. This section should be concise, yet include the most relevant literature available. It should also be a critical appraisal of the primary sources. Try to answer the following questions as you prepare your background section:

Does your investigation open a new field of science or add a new technique to the field?

Does your work build on the work of others? Who are those investigators? What are you doing different?

Did others' work have any flaws? Were there experimental limitations? Do you disagree with their interpretations?

What potential impact does this study have on the field?

#### **Preliminary Studies**

You include your own data in this section. Experiments that you have conducted that would show the funding agency that your methods are reasonable and that you are capable of performing the proposed experiments can dramatically strengthen your proposal. This could include journal articles previously published by you or unpublished work in support of the proposed experiments.

#### **Methods**

The methods section should provide specific information on the methodology you will use to conduct your investigations. This will include research design, instruments used, procedures, and data analysis. You should also include potential alternate research plans as backup. These alternative plans should also be well-thought out and they are used to show the agency that you realize experiments don't always go as anticipated. If you are working together with anyone on these experiments, this is the place to explicitly state the work breakdown and why each researcher is uniquely qualified to do their part. You should also include a timeline of your proposed plan with realistic milestones stated.

### **Impact**

In this section you will explain how the outcomes of your research will impact the scientific community. Think about workers within and without the field of research to answer the question “Who will benefit from my efforts?” You should also include the ways in which you plan to disseminate this new information.

### **Additional Suggestions**

1. If your advisor has a proposal that has recently been funded, use it as a model for basic formatting and logic.
2. Think through every step of your methodology and write down what you think the outcomes will be, what potential problems you will encounter and how you will overcome those problems. This will significantly help you develop your methods and force you to find research articles relevant to your work.
3. Be sure to prepare your talk with the audience in mind.
4. Don't wait till the last minute to get started. Reviewing the literature and refining your methodology can take weeks to finalize.

### **Preparing Your Presentation**

Finish your research no less than two weeks before your talk and prepare a preliminary outline for your presentation. From your outline, make a first draft of the slides you plan to use through PowerPoint. Refine the first draft by adding slides where further information/explanation is necessary and remove slides that are unnecessary or confusing. (see General Suggestions for Delivery below for hints on preparation)

Practice your seminar on your own no later than one week before your presentation to get your timing down. Then do a dress rehearsal in front of a group of friends and your research advisor. Have them give you an absolutely honest evaluation of your seminar and suggestions in writing before they leave. Incorporate their suggestions and rewrite your talk. Practice it again.

### **General Suggestions for Delivery**

1. If you have never been to seminar before, try going to a few to see how it is done. This is particularly helpful if there are student talks (both Master's and Capstone) before yours.
2. It is NOT permissible to use note cards. Memorize parts of your talk, but don't present it stiffly. Your slides should guide your talk through points that you want to cover. Do not read your talk from slides. The majority of the time should be spent looking at the audience as opposed to looking at your slides.
3. Follow the rule: One idea – one slide.
4. Slides containing great quantities of data or other information should NOT be used. Slides or overheads that cannot be read easily from the back of the room should not be used. If you have to apologize for the appearance of a slide consider doing the talk without it.
5. When preparing your talk, assume that everyone in the audience has had and remembers a good bit of general chemistry, organic chemistry, analytical chemistry (CHM 345) and their associated labs. Review basic concepts central to your talk but do not go far afield to review concepts on the periphery of your talk.
6. If you encounter a problem in your talk, move on as best you can. Do not lose your poise because you see someone sleeping or because you are asked a question or because you suddenly think of something new in the middle of your talk.
7. Keep your talk in the time range specified: 35-50 minutes. Be prepared to skip certain sections of your talk if you are running over.