# ENGR 361: Scientific Research Communication

## Assignment #6 – Pilot Study Grant Proposal (Group Assignment)

Pilot studies play an important role prior to conducting a full-scale research project. Essentially, pilot studies are small-scale, preliminary studies which aim to investigate whether crucial components of a main study – usually a randomized controlled trial (RCT) – are feasible. For example, pilot studies are performed to predict an appropriate sample size for the full-scale project and/or to improve the study design/protocols.

### PILOT STUDY GRANT PROPOSAL

Each student in class is assigned to a team of 3-4 investigators. Each team will develop a pilot study grant proposal, which will include the following sub-assignments: a pilot study proposal prospectus, a pilot proposal first draft, a second draft, and a final pilot study grant proposal. Assignment 7 is the oral presentation of this proposal.

### Pilot Proposal Prospectus

A pilot study proposal prospectus is a short preliminary grant proposal (the final proposal will be longer containing more detail) that provides the granting agency an idea about your work and whether or not they want a full proposal. The prospectus must be compelling and interesting to the funding agency.

Since the prospectus is a small version of the proposal, without the detailed specifics, it should contain the same basic features as a proposal. The prospectus needs a title and authors, a description of the proposed research project focusing on the goal of the project and justification for the investigation. The document should contain a hypothesis or study goal, and the approaches proposed to address these goals.

Many private funding agencies require a research proposal prospectus before they will entertain a full proposal. Your task here will be to draft a prospectus that persuades a funding agency to request a full proposal. Thus, if you want the funding agency to give you money, you must express yourself in a clear, logical, and persuasive manner. The prospectus is a distilled version of the full proposal—so while it lacks many details, the document must be compelling*. Give the funding agency no choice but to fund you.*

The body of the prospectus (not including the Budget or References) should be **250-300 words** (double-spaced) and should contain the following parts (explained below):

**Problem Statement** (or Needs Assessment, if you prefer)
**Project Long Term Goal, Hypothesis, and Specific aims (2 aims)**
**Project Methods or Design**
**Project Evaluation**
**Outcomes and Impact**
**Budget**
**References**

## Use headings for each of these sections

**Problem Statement/Needs Assessment:** The problem statement serves as the introduction, and should contain a clear, concise, well-supported statement of the problem to be investigated with the grant funding. The background information provided should be both factual and directly related to the problem addressed by the proposal.

**Long Term Goal and Specific Aims:** Clearly describe the general goal, hypothesis, and specific aims of the project. Try using the words: "The overall goal of this project is to… . The central hypothesis is… . To accomplish this, the specific aims are: 1)… ; 2)… ; 3)… etc.". For example: let's say my long-term goal is to develop safe and effective drugs for treating chemical addictions. My specific aims might be the following: 1) Synthesize and purify a family of organic compounds that block a particular enzyme found in brain cells involved in chemical addiction; 2) Confirm the structure of these compounds by NMR analysis; 3) Assay the enzyme inhibitory activity and toxicity of these compounds with neuronal cells in culture.

**Project Methods or Design:** List the approach you will take and tasks you must complete to meet the aims of the project. If space allows, you could lay them out in a schedule over the grant time period. Make sure your methods are realistic, and justify them over other approaches you could have taken. You are not expected to be an expert here—do a little reading and be logical.

**Project Evaluation:** How will you show that your project has succeeded? How will you evaluate progress towards project goals? No one is likely to fund vague, open-ended projects or research.

**Outcomes and Impact:** How will this change the world, cure a disease, make life better?

**References (not included in page length):** To save space, use footnotes or numbers in your proposal text to refer to the references. List the references, by number, on a separate page.

**Budget:** You will NOT include a detailed budget with the prospectus but you should indicate the total amount of funds you are requesting (assume that the maximum amount for this funding opportunity is $25,000 and salaries are not included).

***Advice:*** *Do not propose to do anything that is so exploratory that you do not know whether you will be able to succeed. If you accept money, it becomes a contract to do whatever you said you would do in the proposal. So, for example, instead of proposing to find a new antibiotic to cure an infectious disease, propose to test a group of new compounds for anti-microbial activity against a strain of bacteria.*

At first glance, this may seem like an impossible task to distill this amount of information and make a compelling case with less than 300 words; however, this is where you need to use your well-honed writing and editing skills. Remember, good science writing is that which gives the sense in the fewest words. This requires careful crafting of your prospectus. My recommendation is that your team get all ideas into a working outline, then compose the first draft from the outline. At this point, edit the draft. Editing an existing draft is always easier than the initial composition.

## Proposal 1st Draft and Proposal 2nd Draft (submit *.docx files for review)

A proposal has sections in common with a research report or paper. The research plan typically consists of background information and preliminary results, experimental design (materials and methods), and expected outcomes. The big differences will be that you need to articulate a question worth pursuing, proper methods used to investigate the question, why you and your institution are the right place to pursue the work, a timeline for the work, and a budget for the work.

Work as a team to identify proposal ideas and then perform the background work to make sure that you are not reinventing the wheel, and that the proposed idea contributes to the field of study. Outline the proposal first as a team helps get all the ideas out on the table. Once you have outlined, you can decide how you want to work on the writing. You might divide up the sections or have everyone work together. Share your drafts with each other to make sure that there is consistency and flow between sections a common voice in the writing. This means that you need to talk to and listen to each other.

**See Final Written Proposal (next section) for the sections of the Proposal Drafts.**

You will be receiving peer review feedback and my feedback during the writing process. That review to be helpful, you should be honest with each other. It is the final product that is graded, so help each other by being honest and thoughtful. We will use the *Sigma Xi Grants-In-Aid of Research* rating form for peer review (https://www.sigmaxi.org/programs/grants-in-aid/apply for more information.) At a future date, you might be interested in applying to this program to support your research.

## Peer Review

We will be doing a Study Sections in class to evaluate the proposals. In the study sections we will do what granting agencies do where there is a peer review and discussion of the proposals and ranking of the proposals. We will use the Sigma Xi Grants-in-aid of research Rating Form for the review.

## Final Written Proposal

The length of the final proposal should be between 2300 and 2800 words (not including references). You do not need to include Letters of Recommendation or Letters of Support.

*****FOLLOW THE FORMAT GUIDELINES FOR YOUR FIELD*****

Complete the sections that provide the following information:

- **Title Page (Title, Authors, Institution) (1 Page)**
- **Abstract (1 Page, single-spaced, <300 words)**
- **Specific Aims Page (1 to 2 pages)**
  - **Aim 1**
    - **Hypothesis**
    - **Rationale**
  - **Aim 2**
    - **Hypothesis**
    - **Rationale**
- **Introduction / Background & Significance (2 to 3 pages)**
  - **Objective & Central Hypothesis**
- **Preliminary Data (if applicable, only if you have collected and processed data directly related to this project)**
- **Research Plan and Methodology (3 or more pages)**
  - **Specific Aim 1 Experimental Design***
    - **Design / Setting**
    - **Samples description**
    - **Equipment / Materials**
    - **Variables**
    - **Protocols**
    - **Data Analysis**
  - **Specific Aim 2 Experimental Design***
    - **Design / Setting**
    - **Samples description**
    - **Equipment / Materials**
    - **Variables**
    - **Protocols**
    - **Data Analysis**
- **Expected Outcomes and Impact**
- **Summary/Conclusion**
- **Brief Timeline**
- **Budget Description and Justification**
- **References**
- **Appendices**

## Formatting & Submission of Proposal

1. Submit an electronic copy (*.docx) of each draft by the designated deadline. **One copy per group**. Inform the professor who will be submitting electronic copies.
2. Submit electronic copies to Dropbox on BeachBoard (drafts will be reviewed for plagiarism).
3. **Final submission: Submit an electronic copy (*.docx) of the final draft.**
4. *****FOLLOW THE FORMAT GUIDELINES FOR YOUR FIELD*****
5. Include a title page. The title page should include a concise title that reflects and emphasizes the content of the project described in the report. The authors' names should follow the title on a separate line, followed by the authors' affiliation, and the date.
6. Include a suitable concise title (in the header), and page numbering (in the Footer).
7. Figures and tables should include proper labels, titles, legends, and include a figure caption. All figures and tables must be referenced within the text. **Figures and tables should be placed within the text in your document.**
8. Accepted referencing styles for references and in-text citations must be used (see below).
    a. Cite References in Text in one of three ways:
    b. By superscript numbers, which appear outside the punctuation if the citation applies to a whole sentence or clause. [1]
    c. By italic numbers in parentheses on the line of text & inside the punctuation *(1).*
    d. By author name and year of publication in parentheses inside the punctuation (LastName *et al*., YEAR).
9. Reference List:
    - ACS

      Author 1; Author 2; Author 3; etc. Title of Article. *Journal Abbreviation* Year, Volume, Inclusive Pagination.

      Example:

      Klingler, J. Influence of Pretreatment on Sodium Powder. *Chem. Mater*. 2005, 17, 2755–2768.
    - APA

      Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number* (issue number), pages.

      Example:

      Scruton, R. (1996). The eclipse of listening. *The New Criterion, 15*(3), 5-13.

**Grading will be based on completion and quality of all components of the assignment (content), submission of all documents by the specified time, and clarity (format, readability, and grammar).**

# ENGR 361: Scientific Research Communication Section ____
# Assignment #6 – Grade Sheet

**Student Names:** _____

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_____ **1st Draft (10)**

_____ **2nd Draft (10)**

_____ **Title Page/ Tables of Contents (5)**

_____ **Abstract (10)**

_____ **Hypothesis & Specific Aims (15)**

_____ **Background & Significance (10)**

_____ **Research Design & Methods (10)**

_____ **Expected Outcomes & Impact (10)**

_____ **Budget & Justification (5)**

_____ **Resources & Environment (5)**

_____ **Timeline (5)**

_____ **Format/Referencing (5)**

_____ **Spelling/Grammar (10)**

_____ **Readability (10)**

_____ **TOTAL (100)**

**Comments:**