

LEWIS-CLARK STATE COLLEGE
DIVISION OF NATURAL SCIENCE AND MATHEMATICS
SENIOR RESEARCH PROPOSAL SOLICITATION
FALL 2008

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PROGRAM GOAL AND SCOPE

The Division of Natural Science and Mathematics (DONSAM), an independent unit of Lewis-Clark State College (LCSC), invites undergraduate students to submit proposals for NS499 research, service, or literature-review projects in partial satisfaction of the graduation requirement. In the process of preparing this senior-research proposal, participating students will become familiar with the procedure by which proposals are prepared and submitted to funding agencies like the National Science Foundation (NSF). The format of these proposals closely follows that required by NSF. The reason the funding agencies, and DONSAM, use this procedure and format is to insure that the research projects are well conceived, carefully planned, and have a reasonable chance of success.

PROPOSAL PREPARATION STEPS

Possible Topic Proposals (due to me Tuesday, September 8)

Propose two different topics on which you would like to conduct your senior research project. Before deciding on a project, please discuss these possible projects with the faculty member who would advise you should you choose this project. You should support each topic idea with a short paragraph that describes what the topic is, why you are interested in it, and who could advise you on this project. Please attach the grading sheet on page 13 of this RFP to your Topic Proposal as well as the filled out advisor form for this assignment on the same page.

Chosen Topic Introduction (due to me Tuesday, September 15)

Select one of the original two areas you wrote about in your introduction. For that area, write a 1 - 2 page introduction that details the specific hypothesis to be tested, activity to be performed, or field of research to be reviewed. You should consult and reference at least five **non-Internet** sources for your introduction; you should use the bibliographic style that you and your advisor decide upon. You will be evaluated on the thoroughness of your research and the clarity and conciseness of your writing. On the grading sheet please note the reference style and the tense you will use for your paper.

Your introduction must be accompanied by a brief letter, sent via email, from a faculty member who will agree to advise this project. The letter should acknowledge receipt of your *Proposal Solicitation*, and include a statement that they are willing and able to support you in the development of your proposal at the level of participation required. Additionally they should specify the appropriate reference and annotation style standard for your profession that you will use for this proposal.

Please attach the grading sheet on page 14 of this syllabus to your Introduction when you send it to me.

Research log (due Tuesdays, #1 due October 6, #2 due December 1)

On each of the specified days, you will bring to class a narrative description of the activities you used to advance your project. You should maintain this log in a logbook inside your three ring binder. In the logbook include the date, number of hours, and specific activities associated with your research project that you have completed. All information related to work on your project should be recorded here. If you were a consultant or contract researcher, this kind of log would form the basis for your billing!

Research Plan (due to advisor Tuesday, September 22; due to me Tuesday, September 29)

You should already know how to use various electronic and print bibliographic databases, and the on-line library catalogues of LCSC, WSU and U of I; you will use these skills to prepare a list of source materials for your proposal. If you do not have these skills YOU are responsible for acquiring them. The list should be prepared as a table, which outlines all the relevant sources

and where you will find them. By the time the research plan is due, you should have obtained and read at least a reasonable cross-section of the materials available in the LCSC and Valnet libraries; these materials will provide additional references that can be added to your list.

It is expected that your research plan will be a “living” document that will evolve as you read and discover the utility (or lack thereof!) of various parts of the literature.

You will be graded according to:

- *How well you have covered your field.* You should have an appropriate range of dates (both classic/old and cutting-edge/recent papers), authors, types of materials (books, journals, maps, etc.) and types of sources within each category of material. You should seek these materials in a wide range of institutions.
- *How well you documented your materials.* You should have complete information listed so you could hand your list to anyone and have them track the material down.

Your research plan should have columns for the following categories (see example)

- Citation (author, year, title, source, volume, page, etc.)
- Which library owns the material (for libraries other than LCSC)
- Call number * **See bold sentence below**
- Status (on shelf, checked out, recalled, ordered, found, received, photocopied, etc.)
- Have you read it?

If you find a full-text article on-line be sure to cite a library that has the journal containing that article and the call number of the journal. Please attach the Research Plan Evaluation Sheet, which you can find on page 15 of this syllabus. Your advisor should review your research plan before you turn it in and complete his/her part of the form.

Detailed Proposal Outline (due to advisor Tuesday, October 6; due to me Tuesday, October 13)

Based on all your resources at this point you will write a detailed outline of your paper. Begin with the large topics and then expand on each topic. The more detailed your outline is, the better. The goal of the outline is to guide you in writing your paper. A well-designed outline will make writing your paper easy!

You will be graded on:

- Completeness: addresses all the major sections of the proposal
 - i.e. all sections and sub-sections of final proposal should be present
- The detail and depth of the outline
 - You should have enough detail that your rough draft can be written directly from the outline by simply turning outline phrases into complete sentences with minor text added for readability
- The logical organization of the outline
- Advisor’s approval (signature on outline)

Please attach the Outline Evaluation Sheet found on page 16 of this syllabus

Student Presentations (present Tuesday, October 27, 12:00pm MLH 310)

Each student will make a 10-minute presentation about the status of his or her research proposal during the normal class meeting time. The presentation will cover:

- the topic of the research, service, or literature review;
- the current state of knowledge on this topic, or the current needs for service;
- the proposed hypothesis to be tested (if applicable); and
- the proposed activities to be carried out during the project,

as far as they are known at that point in the process. Please note the presentation evaluation criteria noted on the Presentation Evaluation Sheet. Bring the Presentation Evaluation Sheet on page 15 of this syllabus to your presentation.

FIRST ROUGH DRAFT for Peer Review (due in class Tuesday, November 3)

You will bring to class one complete copies of your rough draft proposal. **Perfection in the rough draft is not required or expected, but completeness is.** You should include ALL the material you expect to have in the final version, including a complete reference list in the appropriate format. You must come to class on this date with your rough draft and participate in the peer review process. **If your proposal and you are not present during class this day you will receive an automatic 20% penalty plus an additional 10% per day penalty normally given for late work for every day after that.**

You will review the paper of one of your fellow students. Your grade in this exercise depends in large part on your participation. However, part of the grade requires that you make a serious effort to comment constructively on the strengths and weaknesses of the paper you review, since you will expect quality feedback from whoever reviews your paper. You will receive a formal written review of your proposal from your peer reviewer.

FIRST ROUGH DRAFT for advisor review and NS 380 review (due to your advisor Tuesday, November 10; due to me by 8:00 am Tuesday, November 17)

You are required to submit draft of your proposal, including changes made as a result of peer review, to your advisor and to me by 8:00 am in order for their review by the students enrolled in NS 380.

REVISED ROUGH DRAFT (due to me Tuesday, November 17)

You should revise your rough draft based on peer and instructor comments, as well as your own additional research. **FAILURE TO MEET THIS DEADLINE WILL RESULT IN YOU FAILING THE COURSE.**

Final Draft (due to your advisor Tuesday, December 2; due to me Tuesday, December 9)

You should do a third revision of your proposal based on the comments from your advisor and the course instructor. The final draft of your proposal should be accompanied by a brief cover letter from you, addressed to the DONSAM Faculty Review Board (FRB), outlining what issues were raised by your rough-draft reviewers and how you addressed them. The appendix of your final draft must include a letter (copy of email letter is fine), from your advisor documenting that the final draft is satisfactory. You will also include the review forms from your advisor, the peer reviewer, and the instructor.

The final grade of the proposal will be assigned by the FRB based on the thoroughness of your research, the clarity of your writing, and the likelihood that the proposed research could accomplish the stated objectives. You will also be evaluated on the mechanics of writing, including punctuation, spelling, grammar, and references.

FAILURE TO MEET THIS FINAL DEADLINE WILL RESULT IN A FAILING GRADE IN THE COURSE.

PROPOSAL FORMAT FOR ROUGH AND FINAL DRAFTS

Physical Characteristics

- The completed proposal is to be stapled in the upper-left-hand corner.
- All pages must have 2.5-cm (1-inch margins) on all sides.
- Type size must be 12 point in a legible font (Times New Roman is preferred).
- There is a maximum of 26 lines per page; lines must be double spaced (≤ 6 lines in 2.5 cm)
- Pages must be numbered consecutively, beginning with the title page and continuing to the end of the proposal.
- Headings for each major section (listed below) must be centered, bold, in 14-point capital letters.
- Second-order headings within the major sections must be left-justified, bold in 12-point upper and lower case letters.
- Third-order headings must be indented, in 12-point italic upper and lower case letters.

Major Sections

Every proposal must contain the following sections:

- A. Cover Page
- B. Project Summary
- C. Table of Contents
- D. Project Description
- E. References Cited
- F. Proposed Timeline for Completion
- G. Budget, Facilities, Equipment and Other Resources
- H. Methods of Dissemination
- I. Appendices

PROPOSAL CONTENT

Cover Page

The Cover page should contain the proposal title, student name, faculty advisor and date of submission. The title must be succinct, yet scientifically or technically valid in describing your project. The title should be intelligible to a scientifically literate reader. A sample cover page is included at the end of this document.

Project Summary

The project summary should begin with a topic sentence stating the project's major thesis. The summary is not an abstract of the project, but rather a self-contained description of the activity that will result if the proposal is approved. ***The summary may not exceed 1 page in length.*** It should include:

- a statement of objective;
- methods employed; and
- potential impact of the project .

The potential impact of the project may be advancing scientific knowledge, improving scientific or mathematical education, providing service to the college or community, or reviewing and synthesizing a body of published scientific research. The summary should be informative to other scientists in the field and, insofar as possible, to a scientifically literate person.

Table of Contents

The Table of Contents must be on a separate page or pages. It should list the beginning page number of each major section, and any major subdivisions within those sections.

Project Description

The project description must be at least 5 pages long, but may not exceed 10 pages.

The main body of the proposal should be a clear statement of the work to be undertaken and should include the following (not necessarily in this order):

- A thesis statement, usually the hypothesis(es) being tested.
- Objectives for the period of the proposed work.
- Relation to the present state of knowledge in the field.
- Expected significance of the proposed work. What is the implication if the hypothesis proves correct? Incorrect?
- Detailed description of procedures that will be employed and rationale for these procedures. This section should be a “what, when, who and where” of how the study will be carried-out. References to other similar or related studies should be included in this description. If the proposed study is indeed completely unique, then it is

important that this be explicitly stated. Commonly overlooked descriptive material that belongs in this section includes animal handling protocols, human safety protocols, and collaborative relationships developed with land owners/managers and other institutions/individuals who will be involved with the research.

- Relation to longer-term goals of the project.
- Relation to work in progress in your institution and elsewhere.

The proposal description should outline the general plan of work, including the design of activities to be undertaken, an adequate description of experimental methods and procedures, and methodology for collection of samples and analysis of data.

The proposal must describe any collaboration with individuals or agencies. Letters verifying the collaboration must be included as appendices; ***your proposal will be automatically disqualified if you propose the use of facilities or the assistance of individuals whose availability or cooperation have not been documented.***

Visual material such as charts, graphs, maps or photographs are included in the page limit. Charts, graphs and non-photographic images are considered figures. Tabular data are considered Tables. Photographs and maps that are not printed directly on the page of text are considered Plates. Each of these kinds of visual materials should be numbered sequentially in the order they are mentioned in the text. Each visual must have a numbered caption that describes the item. All visual material taken from other sources must be attributed in the caption.

References Cited

Reference information is required. Each reference must include the names of all authors, the year of publication, the title of the book or journal from which the article was taken, the volume number (if a journal) or publisher (if a book), and page numbers. A reader must be able to locate the reference on the basis of the information you supply. Abbreviations are not permissible, but acronyms may be used if approved by your advisor. The format for the references, and their method of citation in the text, must be uniform throughout your proposal. The format should be consistent with standards in the discipline and must be approved by your advisor. Each proposal must have a minimum of 10 non-Internet citations, unless a smaller number has been approved by your advisor. Internet citations are only valid if they have a clearly identified author and are associated with some scientifically-recognized institution, organization or company.

Proposed Timeline for Completion

The timeline for completion will delineate the specific dates by which the steps outlined in the Project Description will be completed. The timeline must include dates for the completion of a final manuscript, and presentation of the project results at a professional meeting or LCSC seminar. The usual time for completion of a Senior Research Project is two or more semesters. The Faculty Review Panel will critically examine this section. You must have well-defined, achievable goals that can reasonably be accomplished in the time envisioned.

Budget, Facilities, Equipment and Other Resources

This section of the proposal is used to assess the adequacy of college resources available to perform the work proposed in the Project Description. Items such as chemicals, equipment, test subjects, travel, etc. should be described, as well as the way in which you intend to cover these expenses. The cooperation of any other faculty members or the use of equipment outside of LCSC should be explained in this section. You must include letters documenting this collaboration in the Appendix. ***Your proposal will be automatically disqualified if you propose the use of facilities or the assistance of individuals whose availability or cooperation have not been documented.***

Products and Methods of Dissemination

This section describes how you intend to disseminate the results of your project. ***All*** projects must generate the following final products:

- *A written report in the form of an extended abstract* describing the rationale, procedures, and outcome of the research, service, or literature-review project. The format of the report will be decided by the individual research advisor, but will typically include much of the information incorporated in the proposal. The report is in addition to any software, web-site, curricular materials, scientific equipment, or other tangible product that the project may produce.
- *A 20-minute presentation and 10-minute question-and-answer session* in the Division of Natural Sciences Senior Project Colloquium. Presentation at a professional meeting or publication in a professional journal is strongly encouraged, but does not replace the requirement for presentation in the Division.

Special Information & Supplementary Documentation

This section must include:

- A letter of support from the faculty member advising your project stating that s/he has read and approved the proposal. The letter should include the date on which the proposal was received by the advisor for review.
- A letter from a mathematics faculty member evaluating any proposed data analysis scheme.
- Copies of the peer, instructor, and advisor reviews.
- For projects that require the use of equipment, instrumentation, or expertise of another agency, company or institution, letters of collaboration are required.

Appendices

Other appendices are for supplemental information that is required to enhance understanding of the proposal, or if permission for equipment or human subjects is required. Common inclusions as Appendices include letters of permission or acknowledgement from land owners/managers and letters of collaboration from other institutions/individuals who will be involved with the research. A proposal that uses human subjects must be approved by the Institutional Review Committee on Human Research.

Further items that may be included in the Appendix are previously published or unpublished work, mathematical derivations, etc. The appendix may not contain additional project description, or graphic materials that circumvent the 10-page limitation for the Project Description.

Deadline

The completed proposal must be received by Jenni Light by 12:00 pm (noon), Tuesday, December 8, 2009. Timely proposals will be reviewed by the Natural Science Faculty Board and assigned grades of A (exemplary), B (accepted with minor revision), C (accepted with major revision), or they will be returned as not accepted in need of rewrite and complete review in the next semester. In such case, you will not receive a grade or credit for this course until a rewrite is submitted and reviewed. Proposals that are submitted after the deadline can receive a grade no higher than C.

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Fall 2009

Your Name _____
(Please attach this sheet to the front of your assignment)

TOPIC PROPOSAL GRADING SHEET

Category	Points Available	<i>Total Topic I</i>	<i>Total Topic II</i>
<i>Content (for each topic)</i>			
Definition of Topic	6		
Why it is Interesting to me	8		
Potential Advisor	4		
<i>Mechanics* (across all topics)</i>			
Grammar, Punctuation & Spelling	7		
Total	25		

**Mechanics are graded on the basis of one point deducted for each error, to the maximum number of points allocated to this category.*

Potential Advisor Name	
Date	
I have talked with _____ about advising him/her on the following project_____. I believe this project is feasible and could be done by this student under my direction.	
Potential Advisor Name	
Date	
I have talked with _____ about advising him/her on the following project_____. I believe this project is feasible and could be done by this student under my direction.	

Comments and Suggested Information Sources:

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Your Name _____
(Please attach this sheet to the front of your assignment)

INTRODUCTION GRADING SHEET

Category	Points Available	Your Points <i>Intro Points</i>
<hr/> <hr/>		
<i>Content</i>		
Statement of Topic	9	
Quality of Research	20	
Advisor Letter	6	
<i>Mechanics</i> *		
Grammar, Punctuation & Spelling	15	
<i>Total</i>	<hr/> 50	

**Mechanics are graded on the basis of one point deducted for each error, to the maximum number of points allocated to this category.*

Reference Style Used:

Comments:

RESEARCH-PROPOSAL PRESENTATION GRADING SHEET

Category	Points Available	Your Points
<i>Content</i>		
Topic of research, service, or lit review	10	
Current state of knowledge/needs for service	10	
Hypothesis to be tested or service/ research goal	10	
Proposed activities	10	
<i>Mechanics</i>		
Loud, clear delivery	5	
Sensible organization	10	
Effective use of visuals ¹	10	
Proper amount of time ²	10	
<i>Total</i>	75	

1. The level of technology is much less important than the effectiveness of the presentation; the blackboard is a perfectly acceptable visual aid.
2. You will be penalized for under time as well as overtime; please practice!

Comments:

DETAILED OUTLINE GRADING SHEET

Category	Points Available <i>(for the outline)</i>	Your Points <i>Outline Points</i>
<i>Content</i>		
Completeness: Covers content in all sections of proposal	15	
Detail and Depth of Outline	15	
Organization of Outline	15	
Advisor's signature/comments below	15	
<i>Mechanics</i> *		
Format and Spelling	15	
<i>Total</i>	75	

**Mechanics are graded on the basis of one point deducted for each error, to the maximum number of points allocated to this category.*

Advisor Signature:	
Date	
<p>Based upon the criteria of detailed outline described in the Call for Proposals as well as the grading guidelines above I feel this student has an</p> <p>A. excellent B. adequate C. inadequate</p> <p>version of a detailed outline. Please write any comments/suggestions below:</p> 	

Comments:

SENIOR RESEARCH PROPOSAL ROUGH-DRAFT EVALUATION		
Category	Points Available	Your Points
<i>Requirements (i.e. completeness of draft)</i>	40	
Cover page	3	
Summary	5	
Table of Contents	3	
Description (including appendices)	10	
References	10	
Timeline	3	
Budget	3	
Methods of dissemination	3	
<i>Quality</i>	45	
Is the hypothesis, and how the hypothesis will be tested, clearly defined?	20	
Is the importance of the research addressed?	5	
Good balance of references?	5	
Are all statements appropriately documented?	15	
<i>Mechanics*</i>	15	
Format and Spelling	15	
Total	100	

**Because this is a rough draft, mechanics are graded on a “within reason” basis. Thus, if document organization of draft is reasonable, but an improvement is suggested, then no points are deducted. Organization at the paragraph and sentence level follow a similar pattern. If paragraphs have topic and concluding sentences and sentence grammar is correct then no points are deducted even if the writing is awkward. There should not, however, be errors such as obvious spelling errors or incomplete or run-on sentences at the rough draft stage.*

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Your Name _____

Evaluator's Name: _____

SENIOR-RESEARCH PROPOSAL FACULTY REVIEW PANEL EVALUATION

Criteria for evaluation will be provided at a later date.

SAMPLE COVER SHEET

**A DOUBLE-BLIND RANDOMIZED TRIAL TO ISOLATE KEY COMPONENTS OF
THE MEANING OF LIFE AS PERCIEVED BY OWNERS OF RUSSIAN AND
JAPANESE AUTOMOBILES**

Principal Investigator: Zbignew Volga
Advisor: Aleksander Soldyanissan

Submitted 6 May 2003