

WRITING INTENSIVE APPLICATION

ESCI 5601 ADVANCED SEDIMENTOLOGY - Fall 2013

<http://www.saa.umn.edu/cwb/application>

1. How do writing assignments and writing instruction further the learning objectives of this course and how is writing integrated into the course? Note that the syllabus must reflect the critical role that writing plays in the course.

Registrants for ESCI 5601 Advanced Sedimentology include a mix of advanced undergraduate majors (typically seniors) and beginning graduate students, so the course is taught at a graduate level. Although mastery of the scientific content is a goal of the course, developing skills in scientific writing and professional communication is the dominant goal. Basically, the students are asked to read, write and speak professionally with written documents constituting 90% of the assignments and 10% as an oral presentation of their original written material. The students produce over 25 pages of written material through 12 assignments, output that greatly exceeds 2500 words.

2. What types of writing (e.g., research papers, problem sets, presentations, technical documents, lab reports, essays, journaling etc.) will be assigned? Explain how these assignments meet the requirement that writing be a significant part of the course work, including details about group-authored assignments, if any. Include the required length for each writing assignment and demonstrate how the minimum word count (or its equivalent) for finished writing will be met.

Three types of written exercises are assigned:

A) Critical Reviews of Published Articles (exceeds 2500 words)

These assignments are the most challenging for the students in that they are asked to examine published papers critically, not only from a scientific standpoint, but also with respect to the quality of the scientific writing. By limiting the length of the reviews to a maximum of 2 pages (single-spaced), the students are forced to practice concise, focused scientific writing in a style necessitated by many professional reports or conference abstracts. The selected published papers represent a spectrum of high-quality writing to poor writing, illustrating the critical relationship between effective writing and scientific advancement.

Reviews are graded on the basis of their depth of critical thinking, logical presentation, grammar, writing style, thoroughness and clarity.

B) Original Research Paper (2500-3000 words counting only the paper's body)

The students prepare an original research paper on a topic of their choosing that is related to sedimentology. The document comprises 10-12 double-spaced pages of

original text excluding figures, figure captions, tables and references that are not limited in length or number.

The instructor gives written and oral feedback at three stages in the preparation of this paper with resubmittal as needed, which sometimes involves personal meetings and multiple resubmittals. Evaluation of the paper is based on four elements:

- Quality and thoroughness of the literature search
- Organization, presentation, writing style and grammar
- Explanation of the science
- Creativity, originality and critical thinking

In addition, each student presents his/her paper orally, typically as a Powerpoint presentation, and receives evaluations from both the peer group and the instructor. Techniques of effective presentation and evaluation criteria are discussed prior to this assignment.

C) Written summaries of the key lecture points (2000-3000 words)

After each lecture or series of lectures on a given topic, the students are asked to write a 1-page summary that examines their ability to synthesize the scientific content and explain it in a concise, well-organized and well written format. Repetition of the exercise provides practice in synthesis and writing, and the evaluation is based on logical presentation, grammar, writing style and clarity.

3. How will students' final course grade depend on their writing performance? What percentage of the course grade will depend on the quality and level of the student's writing compared to the percentage of the grade that depends on the course content? Note that this information must also be on the syllabus.

Mastery of the scientific content and writing performance are intimately linked because poor writing gives the appearance of sloppy science or lack of scientific understanding. Quantifying the distinction between scientific content and writing performance is difficult; thus the numbers below are admittedly approximate.

Calculation of the final grade is based on:

| | |
|-------------------------------------|--|
| 3 reviews of published papers | 30 % (70% writing, 30% scientific content) |
| 8 written summaries of lectures | 20 % (90% writing, 10% scientific content) |
| Original research paper | 40 % (65% writing, 35% scientific content) |
| Oral presentation of original paper | 10 % |

4. Indicate which assignment(s) students will be required to revise and resubmit after feedback from the instructor. Indicate who will be providing the feedback. For group-authored documents, describe how each student will benefit from revision. Include an

example of the assignment instructions you are likely to use for this assignment or assignments.

Based on the instructor's feedback, the students are asked to revise and resubmit their written work at three intervals in the preparation of their original research paper: (1) the chosen paper topic (expressed as a question or problem to solve), (2) the extended outline and draft abstract of the paper as well as (3) the draft of the full paper. All students are required to rewrite and resubmit a minimum of one assignment in the preparation of their research paper, and the due dates for resubmittal are listed on the syllabus.

In addition, paper reviews are assigned three times to give repeated practice in that style of scientific writing. The instructor provides extensive commentary on each individual submitted document followed by group discussion of the assignment in class. Typically the students' writing improves considerably through repetition of this iterative process. The students are asked to address the following questions, citing specific pages and paragraphs in the assigned publications:

- a) *What aspects of this paper represent a significant and original contribution to knowledge?*
- b) *What are the broader impacts of this paper across different fields within the geosciences? How does this paper contribute to fundamental understanding in the geosciences beyond a specific region or beyond a specific field?*
- c) *Are observations and data clearly distinguished from the interpretations?*
- d) *Are interpretations and conclusions justified by the data?*
- e) *How well is this paper conceived and organized? Are the observational/analytical aspects developed logically and clearly? Can you suggest any reorganization of the paper?*
- f) *Are the figures and/or tables clear, complete and internally consistent with the text?*
- g) *Which portions of the text, figures or tables could have been eliminated without detriment to the paper? Which parts of the paper need expanding or more detail to improve their clarity?*
- h) *Which parts of the paper could have been written differently to make the message of the paper clearer or more concise?*
- i) *Can you identify errors in grammar, word usage or syntax? Are idioms used that readers who are an international readership would have difficulty understanding?*
- j) *Are the illustrations and their captions clear, complete and understandable? Is each figure caption understandable if it appears in the absence of the paper's text? Can you make suggestions for improvements?*
- k) *Is appropriate credit given to prior work, i.e. proper citations?*
- l) *Does the abstract appropriately summarize the content of the paper?*

No group-authored exercises are assigned; all assignments are prepared individually.

5. What types of writing instruction will be experienced by students? How much class time will be devoted to explicit writing instruction and at what points in the semester?

What types of writing support and resources will be provided to students?

Prior to each writing assignment, anonymous examples of both high-quality and poorly written assignments are distributed. In addition, class handouts include guidelines and cautionary notes about common errors in grammar, word usage, formatting, citations, etc.

The first class session outlines the content, goals and expectations in the course, but much of that class period is also devoted to preparation for the first writing exercise. A suite of anonymous examples from both past students and practicing professionals illustrate strong versus uninformative reviews of scientific articles. The class compares, debates and discusses the elements of writing that make a review effective versus ineffective. Four days of class discussion focus specifically on scientific writing that are reinforced by intermittent written feedback on individual assignments from the instructor.

Discussion sessions follow each written critical review of a scientific article. Prior to the class discussion, each student will have read the article, written a critical review and received written commentary in response from me. I often initiate the class discussion by introducing a point that was recognized by a number of students. Alternatively, I may trigger discussion by introducing aspects on which the students disagreed, and they take over presenting their contrary viewpoints. Because each student has formulated a prior opinion of the paper, the student-led discussion is vigorous and typically entails:

1) Large-scale aspects of the publication

- Evaluation of the overall structure of the scientific article
- Are the interpretations and conclusions supported by the data and observations?
- Does the paper achieve its mission?

2) Abstract and conclusion sections of the paper

- Do the abstract and conclusions sections accurately summarize the content of the paper?
- The students then suggest strategies and word substitutions to reduce the length of the abstract and summary without compromising content.

3) The paper is then examined at the smaller scale – paragraph by paragraph and figure by figure. The students:

- Examine interdependence between the writing and scientific content of each paragraph

- Highlight passages that they felt were unclear, and the students suggest rewording that would diminish the confusion.
- Discuss grammar and word usage, including technical terms and word usage that differ from vernacular English, but typify the geoscience disciplines.
- Identify idioms that would not be understood by a non-native reader and discuss their usage in professional writing
- Discuss the use of first-person versus third-person perspective (as allowed by each publication), use of present versus past tense, use of active and passive tenses, etc.
- Discuss citation and bibliographic formats, particularly as required by different publications, and proper citation of online sources as well as oral or non-peer-reviewed sources.
- Evaluate the content, design and text elements in images and drafted figures. Maps, graphs, drafted diagrams, field photographs, and images ranging in scale from TEM output to satellite imagery are integral to geoscience writing. Often when geoscience publications are accessed electronically, only the abstract, figure and figure captions appear. Thus the students discuss the content and style of writing that is essential to effective figure captions, especially when isolated from other text.

4) I close the discussion with any key aspects of the writing that I feel the students have missed in their discussion. Thus my role is to answer questions, interject points from experience and moderate the discussion, whereas the students assume leadership in the discussion.

Students are also directed to Student Writing Support at the Center for Writing. Additional guidance is provided through excerpts reproduced from:

Grant, P., 2003. *Geoscience Reporting Guidelines*. Victoria, BC: Geological Association of Canada, 365 p.

Bates, R. L., Adkins-Heljeson, M. D., and Buchanan, R. C. (eds.), 1995. *Geowriting: A Guide to Writing, Editing, and Printing in Earth Science*. Alexandria, VA: American Geological Institute.

Katz, M.J., 2009. *From Research to Manuscript: A Guide to Scientific Writing*. Dordrecht: Springer Verlag, 205 p.

Rossbacher, L.A. and Rhodes, D.D., 2006. *Style Manual for Writing in Geology*. Southern Polytechnic University, Georgia.

No group-authored exercises are assigned; all assignments are prepared individually.

6. If teaching assistants will participate in writing assessment and writing instruction, explain how will they be trained (e.g. in how to review, grade and respond to student writing) and how will they be supervised. If the course is taught in multiple sections with multiple faculty (e.g. a capstone directed studies course), explain how every faculty mentor will ensure that their students will receive a writing intensive experience.

No teaching assistant is assigned to the course. All responsibilities lie with the instructor in a single section of the course.