

## Scientific Communications BCH780 - Fall 2013

### Course Description:

To be useful, scientific research needs to be explained clearly to others--to colleagues, to administrators, to foundations and governmental bodies, and to the public. This course will give students the tools to effectively present their data, their ideas, and themselves to the scientific community. Through a series of directed exercises the students will learn how to write an abstract, a scientific paper, and a grant, and to prepare a poster and to give an oral presentation. The class will draw examples, topics, and exercises from current literature.

### Prerequisites:

Good standing in a graduate program in the physical, chemical or biomedical sciences.

Instructors:	Office Address:	Email:	Office Phone:
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### Faculty office hours:

Writing is a highly personal exercise. Faculty office hours are provided at intervals during the course to allow one-on-one discussion of student writing and progress in the course. Please consult the syllabus for these scheduled times. Of course, meetings can be scheduled with faculty members at other times, as needed.

### Learning Objectives:

On completing this course, the student will be able to do the following.

1. Describe the sections of National Institutes of Health (NIH) and National Science Foundation (NSF) grant applications and the functions of each section.
2. Prepare an NIH-style research proposal. This can be the starting point for developing a Biochemistry qualifying exam proposal or for developing a fellowship application.
3. Evaluate grant applications according to current NIH criteria.
4. Describe the sections and organization of a biomedical science research paper.
5. Write the Abstract, Methods, Results, Discussion and Bibliography sections of a scientific paper in an approved journal style.
6. Design and construct effective figures and tables for publication in journals.
7. Design and construct effective figures and tables for use in posters and seminar presentations.
8. Write effective figure captions.
9. Prepare NIH and NSF biosketches
10. Prepare a detailed academic *curriculum vitae*.

## Required Materials:

1. *How to Write and Publish a Scientific Paper*: 6<sup>th</sup> Edition by Robert A. Day and Barbara Gastel. **Publisher:** Greenwood Press. **ISBN-10:** 0313330409 **ISBN-13:** 978-0313330407
2. *The Elements of Style*, Fourth Edition by William Strunk Jr. and E. B. White. **Publisher:** Longman **ISBN-10:** 020530902X **SBN-13:** 978-0205309023
3. A Thesaurus (Roget's College Thesaurus, suggested)

## Description of Course Activities and Assignments

Course activities will include lectures, class discussions, weekly writing assignments, term papers and peer evaluation sessions (detailed in the schedule, below).

## Assignment Grading

**Weekly writing assignments** (10 total) will constitute 60% of the grade.

**Participation in class discussions** and grant review presentation will constitute 10% of the grade.

**The term paper** (the final, revised version of the grant application) will constitute 30% of the grade.

There will be no examinations in this course.

## Summary Description of Course Assignments

**Weekly writing assignments** will include the preparation of sections of the grant application, research paper, research poster and the *curriculum vitae*, and of revisions of those texts as called for by feedback from faculty or peer review.

**Class discussions** will present examples of text for students to evaluate and improve in real-time. Discussions will follow lecture presentations on the discussion topic, and students are expected to have reviewed lecture notes prior to the discussion session.

**The term paper** assignment will consist of preparation, revision and resubmission of an NIH-style research grant application on a topic chosen by the student. The objective of this exercise is to develop the skills needed to write an effective application. A finished draft will undergo peer review in study section sessions, modeled on those currently used by the NIH. The final revised version of the paper, due near the end of the course, will be graded by course faculty.

## Course Grading Scale

Grader's point totals and participation scores will be normalized to conform with the proportions given for each assignment (see above). The sum of scores will be divided by the total points that are possible, to obtain a percentage score. The grading scale for the course will be as follows.

85 – 100% = A

70 – 84% = B

55 – 69% = C

Graduate students cannot receive a grade of “D” and will therefore receive a failing grade for a grade below 55%.

### **Course Policies:**

#### **Submission of Assignments:**

Weekly writing assignments will be due at the start of class on the dates indicated in the syllabus. Assignments submitted in digital form are due by 5 pm on the dates indicated. Peer review evaluation forms and commentaries are due at the end of the corresponding study section meeting. Late assignments will be assessed a penalty of 5% of the grade score.

#### **Attendance Policy.**

Students are expected to attend all class sessions and study section meetings listed in the syllabus, except as provided by the excused absence policy of the University.

#### **Excused Absences:**

Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

#### **Verification of Absences**

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

#### **Academic Integrity:**

It is the policy of this University that students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

**Please note:** Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

**Accommodations due to disability:**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: [jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu)) for coordination of campus disability services available to students with disabilities.

## Lecture Topics and Schedule for BCH780 - Fall 2013

Classes will be held from 2:00-3:00 pm in B231 BBSRB

Date	Instructor	Topic	Relevant Chapters (Day & Gastel)
Aug. 29	Whiteheart	Course Expectations, Writing Ethics	1, 3, 4, 5 30, 31
Sept. 3	Fried	<b>Coming up with Grant Ideas</b> <i>Assignment 1: Develop your grant topic (digital copy due Sept. 5)</i>	37, PHS Handbook
Sept. 5	Fried	<b>Grantsmanship: Sections of a Grant, Specific Aims, Significance and Innovation.</b> <i>Assignment 2: Write a Specific Aims page for your grant (digital copy due Sept. 10)</i>	37, PHS Handbook
Sept. 10	All	<i>Faculty office hours: individual discussion of grant topics.</i>	
Sept. 12	Fried	<b>Grantsmanship: Preliminary Results, Outcomes, Interpretation, Anticipated Problems and Solutions, Timeline.</b>	Supplemental Material
Sept. 17	Fried	<b>Discussion and Class Exercise: Effective Specific Aims sections.</b> <i>Assignment 3: Write Significance and Innovation paragraphs for your grant (paper copy due Sept. 19).</i>	Supplemental Material
Sept. 19	Fried	<b>Grantsmanship: NIH Biosketch, Review criteria</b>	Supplemental Material
Sept. 24	Garneau-Tsodikova	<b>NSF Student Fellowships: NIH vs NSF</b>	Supplemental Material
Sept. 26	Garneau-Tsodikova	<b>NSF: Broader Impacts, NSF Biosketch, Personal Statement</b>	Supplemental Material
Oct. 1	Waechter	<b>Elements of a Paper: Methods/Results</b> <i>Assignment 4: Methods/Results sections for your paper (paper copy due Oct 8).</i>	10-13
Oct. 3	Waechter	<b>Discussion and Class Exercise: Effective Methods and Results sections</b>	10-13
Oct. 8	Waechter	<b>Elements of a Paper: Introduction, Discussion, Title</b> <i>Assignment 5: Introduction for your paper (paper copy due Oct 15).</i>	Supplemental Material
Oct. 10	Waechter	<b>Discussion and Class Exercise: Effective Titles and Introductions.</b>	Supplemental Material
Oct. 15	Levine	<b>Elements of a Paper: Abstract, Publication process</b> <i>Assignment 6: Abstract of paper (paper copy due Oct 17).</i>	6, 19-22
Oct. 17	Levine	<b>Discussion and Class Exercise: Effective Abstracts</b>	
Oct. 22	Whiteheart	<b>Effective Tables and Figures. Figure design.</b>	16-18
Oct. 24	Whiteheart	<b>Effective Tables and Figures, continued. Figure legends. Statistical significance.</b> <i>Assignment 7: Complete the paper incorporating revisions. Submit with list of revisions (paper copy due Oct 29)</i>	16-18
Oct. 29	Whiteheart	<b>Discussion and Class Exercise: Effective Tables and Figures.</b>	
Oct. 31	Levine	<b>Effective Posters</b> <i>Assignment 8: Prepare a poster (digital copy due Nov. 5)</i>	27, 28

<b>Nov. 5</b>	Levine	<b>Effective Lecture Slides.</b> Study section assignments will be made.	Supplemental Material
<b>Nov. 7</b>	Levine	<b>Discussion and Class Exercise: Effective Slides and Posters.</b> <i>Assignment 9: Written poster reviews (paper copies due Nov. 12)</i>	Supplemental Material
<b>Nov. 12</b>	Levine	<b>Reviewing and Writing Critiques</b> <i>Digital copy (PDF) of grant proposal due, 5 pm</i>	23, 40
<b>Nov. 14</b>	Levine	<b>Discussion and Class Exercise: Editor/reviewer response letters.</b>	
<b>Nov. 19</b>	All	<b>Study Section 1: Grant Review</b>	AHA Guidelines
<b>Nov. 21</b>	All	<b>Study Section 2: Grant Review</b>	AHA Guidelines
<b>Nov. 26</b>	All	<b>Study Section 3: Grant Review</b>	AHA Guidelines
<b>Nov. 28</b>	All	<b>Study Section 4: Grant Review</b>	AHA Guidelines
<b>Nov. 29</b>		<b>Thanksgiving holiday</b>	
<b>Dec. 3</b>	All	<i>Faculty office hours: individual discussion of grant revisions.</i>	
<b>Dec. 5</b>	Waechter	<b>Preparing a CV</b> <i>Paper copy of revised grant proposal due by 5 pm</i> <i>Assignment 10: Prepare your academic CV (due Dec.10)</i>	36
<b>Dec. 10</b>	Waechter	<b>Discussion and Class Exercise: Preparing a CV</b>	36
<b>Dec. 12</b>	All	<i>Faculty office hours: individual discussion of curriculum vitae and other writing questions.</i>	

### Additional Information.

#### Dataset for the research paper:

To make the paper-writing exercises consistent, students will be provided with a dataset derived from an actual research paper. This will provide you with the information needed to construct Figures and Tables and to develop your descriptive text. Not all of the information must be used. You can choose which data to include and how to arrange it when preparing each assignment. The final version of your paper (Assignment 7) should include revisions addressing the critiques that you will have received for each of the sections. In addition to the manuscript text, you should turn in a detailed list of revisions that you have made, giving page and line numbers for each change.

#### Ground Rules and Objectives for the Grant Writing Exercise

The objective of the grant writing exercise is to develop the skills needed to write an effective application. The proposal may be a logical extension of a currently "hot" area of research or a novel, hypothetical problem. You may use your own thesis work as a subject. Potential topics must be discussed with and approved by one of the instructors. The proposal-writing process should take the whole semester.

**FORMAT:** The paper is to be written as a mini-NIH grant proposal.

**Title:** Provide a clear descriptive title. Do not exceed 56 total characters and spaces.

**Hypothesis:** Clearly state a hypothesis. A hypothesis can be a description or model of how you think a particular biological process can occur.

**Specific Aims:** List a small set of Specific Aims (2-3) that you will undertake to prove your hypothesis is correct (or incorrect).

**Background and Significance:** Use this section to describe how you derived your hypothesis and to support your experimental approach. State clearly the problem you will try to solve and explain why it is a significant scientific problem. Describe what pertinent information is already known and precisely what gaps in this information will be filled by your proposed research.

**Experimental Design:** For each Specific Aim give sufficient experimental details to permit the reader to evaluate the possibilities of success and your knowledge of the problem. It is wise to offer alternative experimental approaches to achieve a given Specific Aim, in case your initial plan does not work. Include, in this section, possible experimental outcomes and their interpretations. *How will your data prove that your hypothesis is correct (or incorrect)?*

**References:** Complete list of references cited in grant. Please include complete titles, author lists, journal name, volume, and page numbers.

**Paper format:** 1.5 line spacing with 2 cm margins (top/bottom and left//right) and 11 point Arial font. Deviations will not be accepted. Place page numbers at the bottom of the page.

**Page limitations:** Title, Hypothesis, and Specific Aims (1 page), Background (4-5 pages), and Experimental Design (4-6 pages): a maximum of twelve pages total (not including References). Print a separate coversheet with your name and the grant title. Do not include your name in the body of the grant but do include the title on the first page.

**Review Panel Meetings and Reports:** Each student will be assigned to be primary reviewer of one grant proposal and secondary reviewer of one grant proposal. Primary and secondary reviewers must evaluate the proposal and determine its scientific soundness and feasibility based on the current knowledge of the field. The reviewers will be required to write critiques of the proposal following NIH criteria and using the current NIH review form. Reviewers will also be responsible for presenting (in 10 min) their assigned grants to the review panel during the scheduled study section meetings.