

Approval Not needed by UWUCC or Senate - already a WF course.

LSC Use Only Proposal No:	UWUCC Use Only Proposal No:	Senate Action Date:
LSC Action-Date: <i>App-4/5/12</i>	UWUCC Action-Date: <i>11-144b</i>	

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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Proposing Department/Unit Biochemistry	Phone 74481

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

☐ New Course ☐ Course Prefix Change ☐ Course Deletion
☐ Course Revision ☐ Course Number and/or Title Change ☐ Catalog Description Change

Current course prefix, number and full title: BIOC 480 Biochemistry Seminar I

Proposed course prefix, number and full title, if changing: _____

2. Liberal Studies Course Designations, as appropriate

☐ This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)
☐ Learning Skills ☐ Knowledge Area ☐ Global and Multicultural Awareness ☒ Writing Intensive (include W cover sheet)
☐ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)
 ☐ Global Citizenship ☐ Information Literacy ☐ Oral Communication
 ☐ Quantitative Reasoning ☐ Scientific Literacy ☐ Technological Literacy

3. Other Designations, as appropriate

☐ Honors College Course ☐ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

☐ Catalog Description Change ☐ Program Revision ☐ Program Title Change ☐ New Track
☐ New Degree Program ☐ New Minor Program ☐ Liberal Studies Requirement Changes ☐ Other

Current program name: _____

Proposed program name, if changing: _____

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	<i>[Signature]</i>	<i>2/24/12</i>
Department Chairperson(s)	<i>[Signature]</i>	<i>2/24/12</i>
College Curriculum Committee Chair	<i>[Signature]</i>	<i>3/28/12</i>
College Dean	<i>[Signature]</i>	<i>3/28/12</i>
Director of Liberal Studies (as needed)	<i>[Signature]</i>	<i>4/6/12</i>
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs		

Received

MAR 28 2012

Liberal Studies

REQUEST FOR APPROVAL TO USE W-DESIGNATION

LSC # _____
Action _____

TYPE I. PROFESSOR COMMITMENT

- () Professor _____ Phone _____
() Writing Workshop? (If not at IUP, where? when?) _____
() Proposal for one W-course (see instructions below)
() Agree to forward syllabi for subsequently offered W-courses? _____

TYPE II. DEPARTMENT COURSE

- (x) Department Contact Person S. Sowa Phone 74481
(x) Course Number/Title BIOC 480 Biochemistry Seminar I
(x) Statement concerning departmental responsibility
(x) Proposal for this W-course (see instructions below)

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III. TYPE III. SPECIFIC COURSE AND SPECIFIC PROFESSOR(S)

- () Professor _____ Phone _____
() Course Number/Title _____
() Proposal for this W-course (see instructions below)

SIGNATURES:

Professor(s)

Department

Chairperson

College Dean

Director of Liberal Studies

COMPONENTS OF A PROPOSAL FOR A WRITING-INTENSIVE COURSE:

- I. "Writing Summary"--one or two pages explaining how writing is used in the course. First, explain any distinctive characteristics of the content or students which would help the Liberal Studies Committee understand your summary. Second, list and explain the types of writing activities; be especially careful to explain (1) what each writing activity is intended to accomplish as well as the (2) amount of writing, (3) frequency and number of assignments, and (4) whether there are opportunities for revision. If the activity is to be graded, indicate (5) evaluation standards and (6) percentage contribution to the student's final grade.
- II. Copy of the course syllabus.
- III. Two or three samples of assignment sheets, instructions, or criteria concerning writing that are given to students. Limit: 4 pages. (Single copies of longer items, if essential to the proposal, may be submitted to be passed among LSC members and returned to you.)

Please number all pages. Provide one copy to Liberal Studies Committee.

Before you submit: Have you double-checked your proposal against "The Liberal Studies Committee's Most Frequently Asked Questions"?

I. Writing Summary

The BIOC 480/490 sequence is proposed (together) as a writing-intensive course. The sequence is taught every year and is required for the BS BIOC degree. It is taken by senior BIOC majors. This writing intensive sequence is seen as an opportunity for students to practice professional levels of scientific communication - reading scientific papers, writing up procedures, communicating and interpreting/critiquing the results of other scientists, producing scientific publications, and effectively presenting a seminar.

The students practice the following kinds of writing:

1. Writing to demonstrate reading skills [experimental laboratory procedures]:
Students are given a published reference to a standard assay (which is usually obtained as a "kit") and are required to translate the "Methods" section of the paper into a step-by-step procedure that they would follow if they were doing the experiment in lab. As working chemists/researchers, proper maintenance of a notebook that includes reproducible procedures is a daily requirement. The students are evaluated on detail and clarity of writing, as well as scientific feasibility.
2. Writing to demonstrate knowledge transfer from oral presentations.
Students write content and critical reports based on their attendance at five seminars given by guest scientists. This exercise emphasizes to students the importance of clear communication, helps them distinguish between important vs. trivial details in scientific procedures, allows them to experience a variety of oral presentation styles, and provides them with an opportunity to give constructive written criticism to fellow scientists, a component of peer review.
3. Writing for clarity and for critiquing.
Students read and critique papers from the scientific literature. They present the results in 'journal club' format (or answer a set of written questions on the assigned scientific paper as a member of the audience). The presentations are also peer-reviewed by the students, and are evaluated for thoroughness (background information) and clarity (interpretation of the results in context with the subject). Following the peer review, students discuss how they would revise their presentations to improve clarity.
4. Writing to practice clear communication of scientific principles.
Students are given scientific writing that describes basic concepts in biochemistry, as first described in the literature. They are then asked to 'translate' the concepts into a form that resembles a 'textbook' rendition of the concept, i.e. they read landmark papers (whose information is now common knowledge in textbooks) and must rewrite the concepts, with diagrams/illustrations that help to convey the information to the reader. Diagrams/tables/even cartoon drawings are often valuable aids in explaining scientific complexity. Students practice developing these tools of scientific literacy.

II. Course Syllabus

SYLLABUS OF RECORD FOR BIOC 480 (W) BIOCHEMISTRY SEMINAR I

I. CATALOG DESCRIPTION

COURSE TITLE:	BIOC 480 Biochemistry Seminar I
NUMBER OF CREDITS:	1 cr (1c-0l-1cr)
PREQUISITES:	BIOC 302, 312
COURSE DESCRIPTION:	A discussion of recent trends in biochemical thought. Oral and written reports on assigned readings, library, or laboratory research. Guest lecturers. The combination of BIOC 480-490 counts as one writing-intensive course.

II. COURSE OBJECTIVES

BIOC 480/490 serve together as one writing-intensive course. In the first semester, students will gain experience in reading and evaluating biochemical research reports from the literature. This process will involve written assignments as well as leading and participating in group discussions. Students will also attend and evaluate scientific seminars presented by various speakers. Through these exercises, students will improve their writing skills as they gain an appreciation for the process of scientific discovery, and, most importantly, the methods to present, evaluate, and disseminate knowledge.

III. DETAILED COURSE OUTLINE

The course will consist of **10 writing assignments** (given at least a week before they are due) on particular reference papers, **structured class discussions** about the papers, **journal club**: presentation of assigned paper(s), journal club handouts, participation in journal club discussion, and **written reports on five separate seminars** attended by students during the course of the semester.

Note: 1 hour = 50 minutes or 1 academic hour

- | | | |
|----|--|---------|
| 1. | <u>Introduction: How to Read a Research Paper</u> | 1 hour |
| 2. | <u>Writing Assignment 1: Writing a laboratory procedure from a classic journal article, e.g. Bradford Assay</u> | 1 hour |
| 3. | <u>Writing Assignments 2-4: Analysis of 'classic'(Nobel-Prize winning discoveries) literature papers in Biochemical Research, e.g. Krebs, Mitchell, etc.</u> | 3 hours |
| 4. | <u>Writing Assignment 5: Ethics and "The Immortal Life of Henrietta Lacks"</u> | 1 hour |
| 5. | <u>Writing Assignments 6-8: Analysis of Literature Papers that</u> | 2 hours |

- Form the Basis of Journal Club Assignments
6. Journal Club Presentations/Written Handouts 4 hours
 7. Writing Assignment 9: Review of Effective Scientific Communication 1 hour
 8. Writing Assignment 10: Choosing a Topic for your Seminar/Research Paper 1 hour
 9. Terminating Activity Scheduled during final exam period

IV. EVALUATION METHODS

Grades will be based on the following system:

Writing Assignments 1 -10	50%
Participation in Class Discussions	20%
Journal Club	20%
Seminar Reports	10%
Total	100%

V. EXAMPLE GRADING SCALE

Grade scale for the course is the standard one for the University:

A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F < 60%

VI. UNDERGRADUATE COURSE ATTENDANCE POLICY

The attendance policy for this course will be consistent with the university undergraduate attendance policy as described in the current catalogue.

VII. REQUIRED TEXTBOOKS,SUPPLEMENTAL BOOKS AND READINGS

Students will receive some handouts, but will be required to use library and electronic means to retrieve information. A discussion of ethics will be based on the bestselling book "The Immortal Life of Henrietta Lacks" by Rebecca Skloot, 2010, Crown Publishers.

VIII. SPECIAL RESOURCE REQUIREMENTS

Students are expected to be proficient in retrieving scientific information from the literature and should have access to a computer to use web sites that provide supplementary information. Students should also be familiar with PowerPoint for their Journal Club presentations.

IX. BIBLIOGRAPHY

1. *The ACS Style Guide: A Manual for Authors and Editors, Third Edition*, Dodd, J.S., Ed.; American Chemical Society: Washington, DC, 2006
2. *Biochemistry The Molecular Basis of Cell Structure and Function*, A.L. Lehninger, Worth Publishers, Inc, New York, 1970
3. "Chemiosmotic Coupling in Energy Transduction: A Logical Development of Biochemical Knowledge" P. Mitchell, *Bioenergetics* 3:5-24, 1972.
4. *The Chemist's Code of Conduct*, American Chemical Society, Washington, DC, 1994.
5. "Coupling of phosphorylation to electron and hydrogen transfer by a chemi-osmotic type of mechanism." P. Mitchell, *Nature* 191:144-148, 1961.
6. *The Immortal Life of Henrietta Lacks*, Rebecca Skloot, Crown Publishers 2010.
7. "Rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding", Bradford, M.M. *Anal. Biochem.* 72: 248-254, 1976.

Sample Assignment 1:

Writing a step-by-step laboratory procedure from a published reference. (25 points)

The skill to go from written word to experimental procedure is required for successful laboratory research.

Reference: Bradford, M.M. (1976), "Rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding", *Anal. Biochem.* 72: 248-254. (attached)

This is a 'methods' paper and we will treat it as instructions on how to do a protein assay (which it actually is). Note that published methods also appear in the hard-cover 'Methods in Enzymology' a classic biochemistry reference updated regularly - currently there are at least 480 volumes in the series - as well as other books and journals.

Use this reference to write out a **detailed procedure** for measuring the concentration of an unknown protein solution you are working with in the lab.

- Start with your reagents: what do you need, where are you going to get them? Make a list to include catalog numbers, quantity, and price.
- What solutions do you need to prepare in order to complete the assay?
Write out the exact quantities needed to make each solution.
Write out the exact instructions for making the solutions.
- What equipment is needed? Assume that you have the same instrument listed in the reference, along with cuvettes (you do NOT have a diode array computer-interfaced spectrophotometer)
- How will you analyze your data? Be specific on how you will treat the numbers (again, no computer)

Your writing assignment should be a complete recipe/instruction for the Bradford assay (as it was done in 1976). Note that if you were doing this in 1976, you would not be able to look up the reagents online, but would have to physically find a catalog and page through it to find what you needed (yikes!). And how in the world will you figure the standards without 'excel'?

Based on your reading of the reference, what cautions should you make when analyzing your data and results?

A more common assay (that you probably used in lab) is the BCA assay that comes in a convenient kit. What analytical advantage(s) does BCA have over Bradford?

Now pause and reflect on the current day kits available to do all types of laboratory procedures, and the fact that 1976 is a mere 35 years ago. How will things change 40 years from now (well within your life experience)?!

Grading Rubric: Points are awarded for clarity, conciseness and correctness.

- ____ List of reagents/sources is supplied (0-3 points)
- ____ Procedure is easy to follow and is written step-by-step (0 - 10 points)
- ____ Methods of data analysis are clearly explained (0-5 points)
- ____ BCA assay is compared (0-2 points)
- ____ Reflection regarding progress in science is included, and all writing uses correct grammar, spelling and punctuation (0-5 points)

Sample Assignment 2: Writing a Report Based on Seminar Attendance (10 points)

Outline for seminar report: Use the following outline/questions to guide you in preparing your report on each seminar. A total of five separate reports is required.

Include:

- Seminar Title
- Seminar date/location
- Seminar speaker(s)

Scientific Content:

What was the main subject of the seminar?

(this might be summer research experiences of several students)

Did you understand the experiment(s)?

- Did you recognize the technique?
- Did the data make sense?
- Did the data reflect the conclusions?

What questions do you have regarding this subject?

Presentation Style (constructive criticism):

What is your opinion of the presentation?

- Did the speaker appear knowledgeable and relaxed?
- Were the visual aids clear and helpful?
- Was the talk well organized?

- Was the seminar at a level that you could understand it?
- Did the speaker field questions well?
- Would you suggest any improvements?

Grading Rubric: Points are awarded for clarity, conciseness and correctness.

- _____ Seminar is clearly represented (Date/location/speaker/subject) (0-2 points)
- _____ Methods of data analysis are clearly explained (0 - 2 points)
- _____ Conclusions made by the speaker are compared to the data presented(0-2 points)
- _____ Constructive criticism of the speaker is made (0-2 points)
- _____ All writing uses correct grammar, spelling and punctuation (0-2 points)

Biochemistry Program Statement of Responsibility for All Writing-Intensive Courses:

The coordinator shall provide a copy of this agreement to each faculty member assigned to teach a Writing-Intensive course.

Each faculty member assigned to teaching a Program Writing Intensive Course agrees to the following criteria:

- Writing assignments are an integral part of the course, which promise to enhance student learning (not 'exercises in writing for writing's sake').
- Writing assignments will include various forms of writing such as case studies, laboratory reports, journals, letters, memos, formal essays, research articles, project or grant proposals, etc.
- The improvement of student writing is a clear objective of the course.
- Students will be provided with written instructions that cover major criteria for the evaluation of the assignment(s).
- Students will receive guidance in conceiving, organizing, and presenting written material in ways appropriate to the field of Chemistry/Biochemistry.
- Students will produce at least 5000 words (15-20 typed pages) of writing that will be critically evaluated.
- Each writing assignment will have specified length in terms of minimum number of pages required.
- Writing assignments include at least one major assignment and several shorter different assignments.
- Students will be required to submit drafts of at least one major writing assignment that will be returned with instructor comments/suggestions for improvement before the final copy of the assignment is due, so that students have an opportunity to revise their written work.
- Students will submit final copies of writing assignments for critical evaluation.
- Instructor evaluation of written work will comprise at least 50% of the course grade.

Summary Chart for Writing Assignments*

A. Writing Assignments					
Assignment Title	# of Assignments	# of total pages	Graded (Yes/No)	Opportunity for Revision (Yes/No)	Written Assignment represents what % of final course grade
Writing Assignments	10	10-20	yes	no	50%
Seminar Reports	5	5-10	yes	no	10%
Journal Club	1	oral	yes	yes	20%
	-	-	-	-	-
Totals	16	15-30	NA	NA	80%

B. Examinations (Complete only if you intend to use essay exams/short answers as part of the required number of pages of writing.)			
Exams	Approx.% of exam that is essay or short answer	Anticipated # of pages for essay or short answer, or approx. word count	Exam constitutes what % of final course grade
1.			
2.			
3.			
Totals			

**Total writing assignments should contain at least 5000 words (approximately 15-20 typed pages) in two or more separate assignments; written assignments should be a major part of the final grade—at least 50% or more.*

CHECK LIST FOR WRITING-INTENSIVE PROPOSALS

The Liberal Studies Committee's Most Frequently Asked Questions,
Based on the Senate Criteria for Writing-Intensive Courses

For All Writing-Intensive Courses:

- ☒ Are the writing assignments integral parts of the course, rather than exercises that seem tacked on artificially? Are they assignments that promise to enhance student learning?
- ☒ Have you considered various forms of writing such as case studies, laboratory reports, journals, letters, memos, formal essays, research articles, project or grant proposals, and so forth?
- ☒ Does one of your course objectives explicitly mention the improvement of writing?
- ☒ Will you distribute written instructions, including criteria for evaluation, for major assignments?
- ☒ Will students receive guidance in conceiving, organizing, and presenting written material in ways appropriate to the subject being studied?
- ☒ Will students produce at least 5000 words (15-20 typed pages) of writing that you evaluate? Have you clarified this by giving us the minimum number of pages that you expect for each writing assignment?
- ☒ Are there at least two, and preferably more, different writing assignments?
- ☒ Will students revise at least one assignment after receiving your review comments?
- ☒ Does at least one assignment require students to produce finished, edited prose (as differentiated from whatever informal or draft writing you have included)?
- ☒ Are written assignments (in-class; out-of-class) worth at least 50% of the course grade?

For Type I (Professor Commitment) Writing-Intensive Courses:

- ☐ Have you attended a writing workshop either at IUP or elsewhere? [If not, have you indicated at least equivalent preparation based on such things as graduate education, teaching experience in writing courses, publications, conference attendance, or other professional activities?]

For Type II (Departmental) Writing-Intensive Courses:

- ☒ Does your "statement of departmental responsibility" explain how the department will ensure that the writing component is present regardless of who is teaching? Does it identify the specific department group or individual who is responsible for ensuring this?