LSC # 112
Action 9-3-92

COVER SHEET: Request for Approval to Use W-Designation

TYPE I. PROFESSOR COMMITMENT
(X) Professor Dr. Carl S. Luciano Dr. Frank T. Baker Phone 357-2427/2607
(X) Writing Workshop? (If not at IUP, where? when? _____
(X) Proposal for one W-course (see instructions below)
(X) Agree to forward syllabi for subsequently offered W-courses?

TYPE II. DEPARTMENT COURSE
( ) Department Contact Person _____ Phone _____
( ) Course Number/Title _____
( ) Statement concerning departmental responsibility
( ) Proposal for this W-course (see instructions below)

TYPE III. SPECIFIC COURSE AND SPECIFIC PROFESSOR(S)
( ) Professor(s) _____ Phone _____
( ) Course Number/Title _____
( ) Proposal for this W-course (see instructions below)

SIGNATURES:

Professor(s) Carl S. Luciano Frank T. Baker

Department Chairperson Allan I. Andrews

College Dean William F. Cale

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.

WRITING SUMMARY--BI 263 "Genetics"

I. INTRODUCTION

BI 263 "Genetics" is provided as a sample writing-intensive course accompanying the application of Dr. Carl S. Luciano and Dr. Frank T. Baker (Biology Department) to be designated "W" instructors. The course is taught every semester but is not listed as a Liberal Studies Elective. Although students from other departments in the College of Natural Sciences and Mathematics occasionally enroll, Genetics is primarily intended for Biology majors, for whom it is a required course. Genetics is also a required course for students majoring in Medical Technology, who are many fewer in number than the Biology majors. Due to prerequisites, sophomores rarely enroll in Genetics; most of the students in the class are juniors or seniors. The class size ranges from 27-48 students/semester, with a maximum number determined by two lab sections at 24 students/section. Usually, the lecture portion of the course is team-taught, with Drs. Baker and Luciano splitting the semester on a 50:50 basis. Each faculty member individually teaches one of the two 24-student lab sections. [redacted]

II. TYPES OF WRITING

Four types of writing will occure in BI 263.

(1) Writing to Stimulate Synthesis (7.5% of final grade)

Genetics is a science which directly impacts human society as well as all other branches of Biology. In order to improve students' ability to apply the material learned in Genetics to their other Biology courses and to their own lives, they will write one-page summaries of relevant journal articles selected from the recent literature. Students will receive a photocopy of the assigned article about one week in advance of the due date, along with an assignment sheet stating the instructor's specific expectations. About one-half the assigned summary will be just that---a brief recapitulation of the methods and the findings of the article. In the balance of their writing, students will specifically state how the findings relate to facts and concepts they have learned in other classes or to their everyday life. Three or four 500-word summaries will be assigned during the semester.

(2) Writing to Clarify Thinking (15% of final grade)

Explaining one's thought processes often helps to clarify them and thus make them easier to remember and apply to new situations. In order to improve students' ability to explain their reasoning, they will complete assigned problems in Mendelian genetics, crossover mapping, genetic counseling, physical mapping of DNA and population genetics, and, for at least one problem in every set, provide an explanation of their reasoning

at each step of the solution. All problems will be graded on the basis of accurate answers and, when applicable, on clarity of explanation. Problem sets will only be assigned after students and instructor have gone over sample problems in class. Problems/explanations will either be assigned as homework or included on exams. In all, about ten 200-word solutions will be assigned during the semester.

(3) Writing for Evaluation (25% of final grade)

Students are expected to understand the structure-function relationships in genetic systems and the reasons these relationships have evolved as they have. They are also expected to understand the major lines of evidence which have resulted in new paradigms in the field. They are expected to demonstrate the extent of their understanding through written essays on hour exams. These essay questions will be taken from a set of study questions handed out in advance of the exam. Answers will be evaluated on the basis of organization and factual accuracy, but finished prose is not expected. About six essay questions will be answered (500-750 words/answer) during examinations during the course of the semester.

(4) Writing Genetics for Journal Publication (25% of final grade)

One of the primary objectives of Genetics, addressed mainly in the laboratory segment of the course, is that students gain an understanding of the scientific method of inquiry and experience in its use. Students must demonstrate the level of their achievement through the preparation of laboratory reports in which they explain the design, execution and interpretation of their experiments using a format identical to that of a regular scientific paper . In many ways, the writing of such a report requires the synthesis of all the other writing skills gained in the course. Thus, writing lab reports in Genetics is designed as a two-step sequence. In the first step students complete in-class exercises to gain the necessary skills. In the second step they use these skills to write the formal lab report.

(A) In-class Writing Exercises

To better understand "what goes where" in a paper, students working in teams of four will be assigned an in-class exercise in which they are expected to place various statements, sentences, raw data, derived data, statistical analyses and so on into the appropriate part of a report (Introduction, Materials and Methods, Results, Summary, Discussion or New Questions). The products will not receive a grade. Instead they will be discussed in class and students will have an opportunity to revise their efforts in light of class discussions. The exercise will take place during the first laboratory meeting of the semester.

In order to improve their argumentative skills (needed to write effective Discussion sections) students will conduct class debates during laboratory periods early in the semester. Students will be provided with a set of data or will use data they have generated in their own experiments. Half the students, working as a team, will be assigned the argument that these data support a particular hypothesis. The other half will be assigned the argument that the data do not support the same hypothesis. Each team will prepare its argument for presentation by an elected spokesperson. A small number of grade points will be awarded for effective arguments and counterarguments.

Students may be unfamiliar with the strict format requirements for the presentation of scientific data. To provide practice in following these requirements, students will carry out exercises in which they take a set of data and use it to produce a formal scientific figure (graph or sketch or table) adhering to a standard format. Students will work in teams of four. Assignments will be drawn on transparency film and the class as a whole will discuss and critique them. No grade is to be awarded for practice figures.

(B) Lab Reports

Working with the instructor, students will first formulate a hypothesis relating to a specific system in Genetics. They will next design an experiment to test this hypothesis. and divide among themselves the responsibility for setting up and conducting the experiment. The entire class will share the data derived from the experiment but students will use the common data set to write individual lab reports using an example provided by the instructor or an actual journal article as a format model. Students will prepare and submit a first draft of each report, which will be returned with comments at a conference between student and instructor. Students will revise the draft in light of the comments and submit a revised version for a final grade. Students will submit two finished lab reports of about 2500 words each during the semester.

III. GENERAL COMMENTS

The strategy outlined in this summary has several advantages. First, having gained experience with a very similar strategy in Genetics over the past few years, I have a very good idea of what will "work" and what probably will not. Second, students work in teams for many of the outlined activities. This allows for maximum peer input into the learning process along with revision on an ongoing basis. Finally, many of the outlined activities take place during the hours assigned to the laboratory segment of the course, in a relatively informal setting with a lower student:instructor ratio. This situation encourages

student:instructor conferences on an "as-needed" basis and maximizes the instructor's input into the writing process.

Aug. 12, 1992

To: Reviewers of "W" Applications of C. Luciano and F. Baker
From: C. Luciano CL

In order to avoid potential confusion over the grade breakdown for BI 263 GENETICS as outlined in the syllabus vs. the description of types of writing, I have prepared a separate comparison and present it below.

I. GRADE BREAKDOWN ON LAB/LECTURE BASIS

(A) Lecture		
Hour Exams (3) (include fill-in-the-blank questions, problems/explanations and essays)		60.0% of Final Grade
Journal Article Summaries (3-4)		7.5% of Final Grade
Total for Lecture	67.5%	
(B) Lab		
Lab Reports (2)		25.0% of Final Grade
Problems (5)		7.5% of Final Grade
Total for Lab	32.5%	

II. GRADE BREAKDOWN ON WRITING/NON-WRITING BASIS

(A) Writing		
To Stimulate Synthesis (3-4 Journal Article Summaries)		7.5% of Final Grade
To Clarify Thinking (10 Problems/Explanations)		15.0% of Final Grade
For Evaluation (6 Exam Essay Questions)		25.0% of Final Grade
Genetics For Publication (2 Lab Reports)		25.0% of Final Grade
Total for Writing	72.5%	
(B) Non-Writing		
Fill-in-the-Blank Exam Questions		27.5% of Final Grade
Total for Non-Writing	27.5%	

I hope this comparison will resolve any questions about grade breakdowns for the course. Please feel free to contact me at the Biology Department or 357-2427.

ASSIGNMENT SHEET FOR JOURNAL ARTICLE SUMMARY

Article Title:

Ancient DNA: Still Busy After Death
Science , 253; 1353-1356 (1991)
by Jeremy Cherfas

Directions :

(1) Read the article, along with the inset box on page 1356.

(2) Write a 500-word summary of the article intended for an audience of informed professionals of at least your own level of education.. Your summary should address, but not be limited to, the following points.

(A) What new technology is involved and how is it changing the sorts of questions scientists can ask?

(B) In what way is science changing in response to the new technology?

(C) What new controversies are developing?

(D) What are some long-standing questions the new technology can address? Which of these do you think is the most interesting and why?

(E) What are some other applications of the new technology that were not mentioned in the article?

(3) The summary must be typed or neatly written on one or two pages, maximum. Summaries not in compliance will not be graded.

(4) You should use standard English and spelling in your summary, but you may include scientific jargon if appropriate. You are especially encouraged to use terminology from other branches of science. Summaries with a large number of spelling errors will be returned ungraded for revision.

(5) Summaries will be graded on a 10-point scale with points assigned as follows.

9-10 pts: You have effectively summarized the article and related the material it contains to other aspects of science and to society.
7-8 pts: You have effectively summarized the article OR related the material it contains to other aspects of science and to society
5-6 pts: You have ineffectively summarized the article and /or ignored the relationship between this article and the rest of science and society.
1-5 pts: I get the feeling you did not read the article and/or the directions very carefully. You ought to be able to do a better job.
0 pts: You did not turn in a paper.

ASSIGNMENT SHEET FOR LAB REPORT ON CROSSING OVER IN SORDARIA

DIRECTIONS:

(1) Use the data generated by the class on XX/XX/92 to write a formal lab report of about 2500 words. Your intended audience is the scientific community in general. Thus you must write your report using the format and style of a regular scientific paper.

(2) The lab report is to be typed or neatly handwritten.

(3) Use standard English throughout, with scientific terminology and jargon as appropriate.

(4) For organization, use the format outlined in your lab book in Chapter One.

(5) To resolve any questions of style or usage, or format questions not covered in your lab book, refer to the class collection of journal article reprints at the demonstration table or use another scientific journal (The Journal of Heredity, Genetics, etc.) as a reference.

(6) Use statistical analyses as appropriate. The more thoroughly you analyze the data, the better your report will be.

(7) Be sure to state a hypothesis in the Introduction. Be sure to state whether the data support or do not support the hypothesis in the Conclusion.

(8) Do not repeat material from your lab book in Materials and Methods. Write only the changes related to the design and conduct of the experiment. Reference your lab book for the rest.

(9) You should be able to come up with 3 or 4 New Questions raised by the results of the experiment. The questions should be substantive, not trivial, and should relate to the biology of the system rather than experimental details. A New Question which begins with the words "I wonder what would happen if...." is almost always trivial. Use the New Questions section to suggest meaningful new experiments.

(11) In your Conclusion, be sure to address the following specific points: (A) Does recombination frequency vary with experimental parameters in a reasonavble way? (B) How is gene conversion affected by the experimental variables? (C) What controls were used and how did they react? (D) Are there any other data which bear upon the hypothesis we are testing? (E) What were some problems or sources of error within the experiment and how could we fix them?

(10) First drafts are due on XX/XX/92.; Final revisions due on XX/XX/92.

BIOLOGY 263 (GENETICS) SEMESTER SYLLABUS
FALL, 1992
LECTURE AND LABORATORY

I. Instructors:

Dr. Frank T. Baker, 126A Weyandt 357-2706
Dr. Carl S. Luciano, 23 Weyandt 357-2427

II. Required Texts:

(1) An Introduction to Genetic Analysis by D. Suzuki, A. Griffiths, J. Miller and R. Lewontin, (4th ed.) 1989, WH Freeman and Company, New York.
(2) Student Companion (to above text) by D. Lavett.
(3) Genetics Lab Manual, by Baker and Luciano, available at Copies Now

III. Other Required Materials

Loose-leaf folder or ring binder for use as lab notebook, metric system graph paper, including semi-log paper, felt-tip marker (Sharpie) for labeling glassware, small metric system ruler. These items will be needed for lab, and your instructor may require additional items. A calculator is also helpful, but not required for lab work in BI 263.

IV. Office Hours

Office hours for Drs. Baker and Luciano will be posted during the first week of the semester. If you need time outside regular office hours, you are encouraged to schedule additional consultations.

V. Review Sessions

At least one review session will be scheduled before each exam, including the exam scheduled during Finals Week.

VI. Attendance

Attendance is expected at all lecture and laboratory meetings. A missed lecture or laboratory assignment is given the grade of zero and may not be made up except in emergency situations (decisions made on an individual basis) or with a physician's excuse. Unexcused absences from laboratory will result in a grade of zero for that day's work. Due to the difficulty in setting up experiments, it will in no case be possible to make up a missed experiment. It may, however, be possible to attend a later laboratory section during the same week as the missed experiment, but this depends upon availability of seats and instructor's permission.

VII. Late Submissions

Any assigned work submitted after the due date or time will be penalized 20% (i.e. a 100% becomes an 80%).

VIII. Policy on Repeat Students

Students who are repeating the course must also repeat the lab.

IX. Grading

Your grade in BI 263 will be derived from the following sources, each of which is described more completely in a separate section below. Your Lab Manual has a complete description of requirements for Lab Reports (Ch. 1). These and other assignments will be described in detail with individual assignment sheets during the semester.

Source	% Contribution to Final Grade
Homework Problems	7.5
Lab Reports	25.0
Journal Article Summaries	7.5
Exams (3 total)	60.0

(A) Homework Problems (Writing to Clarify Thinking)
7.5% of Final Grade

Explaining one's thought processes often helps to clarify them and thus make them easier to remember and apply to new situations. In order to improve your ability to explain your reasoning, you will complete assigned problems in Mendelian Genetics, crossover mapping, genetic counseling, physical mapping of DNA and population genetics, and, for at least one problem in every set, provide an explanation of your reasoning at each step of the solution. All problems will be graded on the basis of accurate answers and, where applicable, on clarity of explanation. Problem sets will only be assigned after students and instructor have gone over sample problems in class. Expect about 5 sets of homework problems during the course of the semester, with a least one 200-word explanation assigned for each.

(B) Lab Reports (Writing Genetics for Journal Publication)
25.0% of Final Grade

One of the primary objectives of BI 263, addressed mainly in the laboratory segment of the course, is that you gain an understanding of the scientific method of inquiry and experience in its use. After working through writing exercises designed to

train you for the task, you will demonstrate the level of your achievement through the preparation of laboratory reports in which you explain the design, execution and interpretation of your experiments using a format identical to that of a regular scientific paper.

Working with the instructor, you will first formulate a hypothesis relating to a specific system in Genetics. You will design an experiment to test this hypothesis and divide among yourselves the responsibility for setting up and conducting the experiment. The entire class will share the data generated by the experiment but students will use the common data set to write individual lab reports using an example provided the instructor as a format model. You will prepare and submit a first draft of each report, which will be returned with comments at a conference between student and instructor. You will revise the draft in light of the comments and submit a revised version for a final grade. You should expect to submit two finished lab reports of about 2500 words each during the semester.

(C) Journal Article Summaries (Writing to Stimulate Synthesis)
(7.5% of Final Grade)

Genetics is a science which directly impacts all other branches of Biology and human society as well. In order to improve your ability to apply the material learned in Genetics to other Biology courses and to your own lives, you will write one-page summaries of relevant journal articles selected from the recent literature. You will receive photocopies of articles about one week in advance of the due date, along with an assignment sheet stating the instructor's specific requirements. About one-half the summary will be just that---a brief recapitulation of the methods and findings of the article. In the balance of your writing, you will specifically state how the findings relate to facts and concepts you have learned in other classes or to your everyday life. You should expect three or four 500-word summaries to be assigned during the course of the semester.

(D) Examinations
(60% of Final Grade)

A total of three non-comprehensive hour exams will be given during the semester, one of which will take place during finals week (see schedule). Each exam will consist of three parts, outlined below. The total contribution of each part to the final semester grade is also given.

1. Fill-in-the-Blank
(27.5% of Final Grade)

The first section of each exam will consist of a set of identification questions whose correct answers consist of one or two words. A blank space will be provided for each one or two-word answer, hence the name "Fill-in-the-blank".

2. Problems (Writing to Clarify Thinking)
(7.5% of Final Grade)

The second section of each exam will consist of a set of problems similar to those assigned as homework. At least one problem in each set will require an explanation of your reasoning at each step along the way, just as the problems assigned as homework.

3. Essay Questions (Writing for Evaluation)
(25% of Final Grade)

You are expected to understand structure-function relationships in genetic systems and the reasons these relationships have evolved as they have. You are also expected to understand the major lines of evidence which have contributed to new paradigms in Genetics. Thus the third section of each exam will consist of one or two essay questions. Your answers will demonstrate the extent of your understanding. Essay questions on exams will be taken from a set of study questions handed out in advance of the exam. Your answers are expected to be well-organized and factually accurate, but not in the form of finished prose.

X. BI 263 as a "W" Course

The course is in the process of review for designation as a Writing-intensive ("W") course. This process will not be complete by the beginning of the Fall, 1992 semester, but if successful, Genetics will be retroactively designated a "W" course and can be used as such to satisfy the requirements of the Liberal Studies Program at IUP. You will be notified of further developments as they occur.

XI. Lecture Schedule

Date [1]	Topic [2]
S-03	Introduction, DNA as Genetic Material (1)
S-08	DNA Structure and Properties (11)
S-10	DNA Structure and Properties (11)
S-15	Mechanisms of Mutation(7)
S-17	DNA Packaging (11)
S-22	Chromosomes and their Structure(3,14)
S-24	Forms of DNA Replication(11)
S-29	Chromosome Distribution During Replication(3,14)
O-01	Mendelian Genetics I (2)
O-06	First Hour Exam
O-08	Mendelian Genetics II (2)
O-13	Variations From Mendelian Ratios (4,6)
O-15	Sex Linkage and Sex Determination (3,8,9)
O-20	Recombination and Mapping I (5)
O-22	Recombination and Mapping II (5)
O-27	Expression Genetics (12)
O-29	The First Genetic Code and tRNA (13)
N-03	tRNA and the Second Genetic Code (13)
N-05	Prokaryotic Gene Regulation I (16)
N-10	Second Hour Exam
N-12	Prokaryotic Gene Regulation II (16)
N-17	Prokaryotic Gene Regulation III (16)
N-19	Eukaryotic Gene Structure I (21)
N-22	Eukaryotic Gene Structure II (21)
N-24	Eukaryotic Gene Regulation I (21)
N-26	Thanksgiving Recess--No Class
D-01	Eukaryotic Gene Regulation II (21)
D-03	Eukaryotic Gene Regulation III (21)
D-08	Bacterial Transformation/Conjugation (10)
D-10	Gene Transduction (10)
D-15	Transposons-Mobile Genetic Elements (19)
D-19	Final Exam 10:15-12:15 (Saturday Morning)

(1) S=September, O=October, and so on

(2) Numbers in parentheses refer to reading assignments by chapter in the Suzuki text

Note that the schedule may need to be adjusted as the semester proceeds. You will be notified of any changes.

XII. Reading Assignments

Reading assignments in the Suzuki text are made on the schedule above. Additional assignments may be made from time to time. Although your exams will emphasize material from lecture, you are o responsible for the assigned reading in the text. In some cases ture topics may not exactly coincide with text chapters. If this is the case, use the Index to find additional reading.

XIII. Lab Schedule

Week of: (1)	Short Title(2)
S-08	DNA Purification and Properties (Rapid Isolation of Bacterial DNA)
S-14	DNA as the Genetic Material (Plasmids)
S-21	Cytogenetics I (Organization/Analysis of Chromosomes)
S-28	Cytogenetics II
O-05	Effect of Colchicine on Mitosis
O-12	Mendelian Genetics and Probability I
O-19	Mendelian Genetics and Probability II
O-26	Recombination in Sordaria
N-02	DNA Sequence Analysis Using Computers
N-09	Gene Expression in the Lactose Operon
N-16	Restriction Enzyme Analysis of DNA and Agarose Gel Electrophoresis of DNA
N-23	No Genetics Lab
N-30	Population Genetics I
D-07	Population Genetics II

(1) Abbreviations as in Lecture Schedule

(2) Short Titles provide brief descriptions of each experiment's content but do not in all cases correspond to experiment titles in the Genetics Lab Packet. For clarity, these titles are also included as needed. Please note that experiments in the lab packet are not presented in the same order as they are scheduled during the semester.

Note that several experiments extend over two or more lab meetings.

The lab schedule above is designed to allow for maximum flexibility as well as some overlap between experiments. Since, in some cases, it is impossible to predict the exact amount of time required for certain activities, it may be necessary to adjust the lab schedule during the course of the semester. You will be notified of any changes.

In order to complete your lab work in an efficient way, you will need to read the appropriate section or sections of your lab packet before class. You will improve your ability to understand lab material if you locate and read the appropriate sections of the Suzuki text and the Student Companion before lab. Bring these two books to lab each week.

Reading assignments are designed primarily to provide background information. They do not always contain detailed instructions or even a specific experiment to be conducted. You and the other members of your team are expected to design many of your own experiments.