

Writing Intensive Course- Proposal Form

Instructor: Maureen A Morrow

Course Title: General Microbiology, Bio 15350 (single section course)

Department: Biology

School: Liberal Arts and Sciences

Catalog Description: Morphology, physiology and genetics of micro-organisms, especially bacteria. Principles of identification, classification, growth, and reproduction and the effects of physical and chemical agents. The laboratory exposes the student to basic techniques. Prerequisites: 15201 and 15202.

Writing requirements:

The laboratory component of the course contains both formal and informal writing assignments. In each of 12 laboratory experiments, the student will be required to record experimental data in a laboratory notebook. This notebook will require double entry journal recording and analysis of data. These writings will be assessed by either the instructor or peers. The formal laboratory writing will also consist of four laboratory reports. Informal writing in the laboratory will consist of activities such as brainstorming and free writes.

The lecture component of the class will consist of several informal writing assignments. Free writes, to summarize lecture material, will be done approximately once per week. In addition, the students will be required to read and write about a current topic in microbiology. This formal written assignments will consist of an individual component which will include the summary of information from a reading assignment. The second, group component of the assignment, will consist of group discussion of assigned questions and the composition of written answers to be handed in for a group grade. Exams generally consist of short answer/ essay type questions.

Submitted with proposal:

Narrative

Course syllabus

Sample in class group assignment

Narrative:

General Microbiology covers a broad range of biological topics as they specifically relate to micro-organisms. After learning the basic skills and techniques of the microbiology lab (weeks 1-3), the student is capable of performing a diverse set of experimental studies. These experiments directly relate to topics covered in the lecture. The speed with which these organisms grow allows the student to perform, complete and analyze controlled experiments which compare the physiology, biochemistry, and genetics of many types of organisms. The availability of the Electron Microscope Facility has also allowed us to expose the students to the types of data one can obtain with increased technology.

The laboratory portion of the course offers the students an opportunity to master microbial methods of analysis and to practice critical analysis. Experimental procedures will be discussed formally and explored with brainstorming and/or free writing activities. Notebook results will be recorded as per a specified format including the double entry journal style recording of data. Additionally, the students will subsequently discuss the results in a journal entry form. Preparation for the lab will involve brain storming exercises.

The individual isolation experiment represents an opportunity to participate in a independent research project. By simply providing the students with the results of previous experimentation, the entire scientific process may be carried out. The provided data (observations) are used to synthesize a scientific question. The corresponding hypothesis is then generated. The experimental design is carried out to support or disprove the hypothesis. The observation of data will require both critical analysis and statement of conclusion. The reports will require the communication of newly acquired knowledge. Additional experiments encompass portions of this scientific process. The laboratory work is performed in pairs and groups and as such results in the peer review of ideas.

The lecture portion of the course offers opportunities for informal writing involving critical analysis and the exploration of new ideas. The individual/ group assignment allows written and verbal communication of ideas and the inherent peer review of group work. Brainstorming is employed during most lectures and free writes will be used at least once each week for the purpose of summarizing or further exploring specific concepts.

Review of the first two laboratory reports and the notebook section checks each represent a small percentage of the grade and will serve as a faculty review of the students' writing. As each report must follow the same format, each will serve as an opportunity to revise previous work. The individual/ group assignments will encompass both faculty and peer review. Opportunities will be offered during the laboratory periods for tutorial assistance with paper preparation.

Bio 15350 Spring 1998
General Microbiology
Writing Intensive
Prerequisites: Bio 15201 and 15202

Dr. Maureen A. Morrow
morrowm@matrix.newpaltz.edu
CSB 219, X3776; Bio. office X3770
Office hours: Tuesday 3:30-5:30
Wednesday 3-5
and by appointment

Overview:

Microbiology, as the name implies, is the science of small, living things. The diversity of small living things requires that the topics covered in this class be equally diverse. These topics will parallel many of the subjects covered in General Biology, but will be limited to the interesting aspects that apply to microorganisms. You will have an opportunity to examine the significance of General Biology topics in the context of microbes. I expect your understanding of the General Biology subject matter to be complete, or to be supplemented by readings from the Campbell text (on reserve). Microbiology laboratory research involves, in part, the characterization of small, living things. This characterization is done at many levels, including morphological, biochemical and genetic analysis. Microbial analysis requires the use of specialized techniques that you will be required to master. Additionally, microbial work requires the generation and testing of hypotheses, careful note taking, plus the analysis and communication of results. You will practice all of these skills in the laboratory.

My goals for this course are to demonstrate the diversity and applications of the microbial world while allowing you to explore the techniques applied in the microbiology lab. I have designed this course to require your active participation. To appropriately participate, one must keep all work and reading assignments up to date. Each week, you should expect to spend a minimum of two hours outside of class for each credit hour.

Lectures:

Tuesday and Thursday, 11:00 - 11:50 am CSB 221

Syllabus on page 6

I will supply various handouts over the course of the term. Any handout not picked up in class will be placed on the window sill in the lab (CSB 209). As stated in the Undergraduate Studies Catalog, "Each student is responsible for all work presented in the classroom sessions of each course for which the student is registered. Students who absent themselves from class, therefore, do so at their own risk, and in determining a student's grade, the instructor may consider absences."

Readings

Principles of Microbiology 2nd Edition, 1997, Ronald M. Atlas.

Microbes in Action Fourth Edition, 1991, Seeley, VanDemark and Lee.

Lab Manual Appendix (provided in class)

Reserve reading in the library

In class handouts

Reserve Readings

Available in the library: Campbell's Biology, a microbiology study guide and a packet arranged by me, containing old exams, reports, writing guides and portions of Bergey's manual.

Required Materials

- 1-Laboratory marker. You must purchase at least one water and alcohol resistant marker.
- 2- Laboratory notebook. You must purchase a carbon copy notebook of at least 50 pages.
- 3- Lab coat. Available in the book store.

Prerequisite

Appendix II of Principles of Microbiology is a review of the biological chemistry you have learned in General Biology (Bio 15201 and 15202 see Campbell Chapters 1-6). I expect you to know this information from your general biology course (or it's equivalent). Please use this chapter as a review and reference. We will refer to portions of this appendix throughout the semester. The Campbell text can be used to review your understanding of this material.

Writing Intensive Course

The writing-across-the-curriculum requirement was established to provide students with more opportunities to write. Writing is both a mode of thinking and learning. Writing forces one to think differently and thus learn differently. This course is not a writing course, but a microbiology course that provides the student with an opportunity to explore and express knowledge in a written form. Some writing exercises will not be graded. For the graded assignments, I will be most interested in the content and quality of thought expressed, not the nuts and bolts of English grammar. I will expect correct basic grammar. The reserve reading in the library contains a large amount of additional information with regard to the graded writing assignments.

Laboratory:

Tuesday and Thursday 1-3 p.m., CSB 209.

The laboratory outline is provided in the Lab Manual Appendix. The laboratory outline lists the exact experiments to be performed in class each week. You are required to complete all laboratory assignment in order to receive a passing grade. I expect you to spend a minimum of 1/2 hour each week to prepare for the laboratory activities.

Attendance in lab each week is required. You will be allowed two unexcused absences before being penalized. You will be responsible for all material missed during any absence. Any additional labs missed without proper justification will result in the loss of 10% of the laboratory assignments (310 points). If you are ill, you must call me before the laboratory period begins and arrange a time to make up the work. If you know you will be out of town, you must inform me at least two weeks prior to your leaving. Only in the case of an emergency, accompanied by a note from a medical doctor, clergy member or the Dean, will you be allowed to make up a lab.

Note: If you will require a recommendation letter, I generally need at least two weeks notification. Please provide me with stamped and addressed envelopes. A resume or personal statement will help me to write a better letter.

Assignments and Grading:

| Assignment | Points | Dates | Total |
|---|---------|-----------------------------------|------------|
| LECTURE | | | |
| In class exams | 100each | 2/10 3/10 4/16(drop lowest) | 200 |
| In class project: Antibiotic resistance | | | |
| Individual | 20 | 3/19 | 20 |
| Group | 30 | 3/19 | 30 |
| 5-10 minute oral presentation, bacteria | 20 | 4/7-4/9 | 20 |
| Final exam | 125 | 5/14 9:30 am | 125 |
| LABORATORY | | | |
| MMWR update oral presentation | 5 | daily from 1/27 | 5 |
| Laboratory notebook assignments | 90 | see schedule on page 4 | 90 |
| Report 1 Isolation from dirt | | | |
| rough draft | | 2/12 | |
| peer critique | | 2/12 | |
| final draft | 10 | 2/17 | 10 |
| Report 2 Differentiation | 30 | 2/24 | 30 |
| Report 3 Bacterial Isolation | | | |
| Individual assignment | 20 | 2/19 | 20 |
| Group assignment | 30 | 2/19 | 30 |
| Report | 50 | 4/2 | 50 |
| Pure strain of bacteria | 5 | by 3/17 | 5 |
| Report 4 Water analysis | 50 | 5/5 | 50 |
| Laboratory maintenance grade | 20 | | 20 |
| | | | <u>705</u> |

All reports must be turned in order to receive a passing grade.

Group projects will be given a single grade for all members of the group. Late assignments will lose 10% of the total points possible for each day late. You are responsible for any lost assignments; make a photocopy of everything before you hand it in. If I discover that anyone has copied information from another, both parties involved will receive only 50% of the actual grade. Plagiarized reports will not be given credit. If you feel that a mistake was made in the grading of any assignment, I will entertain a written request for a re-grade. This request must explain the potential discrepancy to be considered. All reports should be typewritten.

The final grade will be based on the raw percentage of points successfully completed. I claim the right to curve these raw scores up. A=100-90%, B=89-80%, C=79-70%, D=69-60%

Exams

I will drop the grade of your lowest exam and therefore there will be no makeup exams for any reason. The exams will cover lecture and lab material. Each will stress the information covered during the given period, though some concepts will be carried over from earlier lecture material. I suggest you study the lecture notes and use the text as a reference to prepare for lecture and study for exams. I also suggest that you study in groups; I will test your understanding of concepts in addition to your retention of facts. See the reserve readings for a copy of an old exam.

In Class Project

You will be performing individual and group analysis of information pertaining to a current concern in the field of microbiology: antibiotic resistance. To complete this assignment, you must be in class on 3/19. This assignment will consist of two parts. The first part will be an individual project for which you will prepare and hand in answers to a set of questions. The second part will be a group project. You will be assigned to a group for the class period 3/19. You will be given a second set of questions that will be answered as a group and handed in at the end of class.

Final Exam

The final will be cumulative (approx. 25 points); the remaining 100 points will include information covered in the last quarter of the term.

Laboratory Reports

See guidelines (handout) and sample grading sheet (page 8)

Communication of scientific data requires special skills and careful work. You will practice these techniques by reporting on your findings from experiments:

- #9 Isolating a pure culture from Dirt (Report 1);
- #13 + 20 + 38 Differentiation A, B and C (Report 2);
- #43,44,45 or 46 Isolation of a specific bacterium (Report 3);
- and #58 Water Analysis (Report 4).

Reports 1 and 2 should be 1-5 pages long. Reports 3 and 4 should be 5-10 pages long. You may be asked to address specific questions in your discussion. Guidelines for the preparation of reports will be handed out in lab. Examples of reports from previous semesters (both good and bad) are on reserve in the library.

The Isolation and Water Analysis assignments should give you a feel for 'real' research in the area of microbial isolation/ identification and experimentation. Both experiments will be completed over the course of several lab periods. The preparation of these reports will involve both individual and group work. The experimental protocols which you will design and the techniques you will employ for this assignment are commonly used to isolate and define newly discovered organisms or to examine the structure of bacteria. The preparation of these reports will involve both individual and group work.

The Isolation experiment is an individual project that will require your analysis over several weeks. Before the 2/19 lab period, you will be required to choose a type of organism (*Pseudomonas*, *Bacillus*, *Staphylococcus* or Lactic Acid) and devise a plan to isolate that organism from your everyday life. You must read the laboratory manual and the textbook to choose your organism, the source and the procedures you will need to enrich, isolate and characterize your organism. The 2/19 laboratory period will be set aside for the group discussion of the isolation plan.

The Water Analysis experiment will be devised as a class project and everyone will share the data. The reports will be written up individually. During the 3/31 lab period, will design the exact experimental protocol as a class.

Lab Maintenance Grade

You will be judged on your ability to maintain the laboratory equipment and the laboratory environment.

Laboratory Notebooks

See handout for Lab Notebook Guidelines. This information will be discussed during the laboratory period of 1/27.

The careful collection of information is necessary in the lab and in many other aspects of life. This assignment will force you to be organized and teach you an essential habit needed for being a good scientist. Your notebooks must remain in the lab throughout the course of the term. This restriction has several purposes: 1) helps to ensure complete recording of data during the lab period, 2) prevents loss of data and 3) allows your lab partner to obtain data when you are not there. I will be grading specific aspects of the notebook on specific dates, but if your notebook is found missing at any time, you will lose 20% of the final notebook grade (100 points). You are responsible for reading and applying the information supplied in the laboratory notebook guidelines.

The laboratory notebook (yellow carbon copy) is due according to the following schedule:

| Experiment | due | section(s) | points |
|-------------------|-------------|---|------------|
| 7&9 | 1/29 | all | not graded |
| 13, 20, and 382/5 | | Intro. and proc. <i>rough draft</i> * | 10 |
| 28 and 35 | 2/24 | results | 10 |
| 43,44,45or46 | 3/3 | purpose and procedure, <i>rough draft</i> * | 10 |
| 19 | 3/5 | results, discussion and statement | 20 |
| 43,44,45or46 | 4/2 | results | 10 |
| 71 | 4/7 | discussion and concluding statement | 10 |
| 58 | 4/9 | purpose and procedure, <i>rough draft</i> * | 10 |
| index | unannounced | | <u>10</u> |
| | | | 90 |

rough draft: These notebook pages will be prepared during the time provided in the laboratory. Follow the guidelines for writing reports, not for writing notebook pages. I will provide you with feedback to help you with writing the reports.

Oral presentations

These assignments are to allow you practice speaking in front of groups. They will be graded on completeness and accuracy. Specific instructions and sign up sheets will be provided in class. For the MMWR update presentation, you will summarize information from the CDC internet site. For the bacteria presentation, you will describe an assigned group of bacteria to the class.

Spring 1998 Lecture outline 28 lecture days

Relevant Campbell chapter numbers are included in parentheses.

| | | | |
|----------|--|-------|---------------------------------|
| 1-20 | Introduction | | Ch. 1 (23-25) |
| 1-22 | Cell structure, membrane | | Ch. 3-1, 3-2(7,8,26) |
| 1-27 | Cell structure, transport | | Ch. 3-1, 3-2 |
| 1-29 | Cell structure, cell wall | Ch. 3 | |
| 2-3 | Flagella and chemotaxis | | Ch. 3 |
| 2-5 | Cell structure | | Ch. 3 |
| 2-10 | Microbial metabolism | | Ch 4 (9) appendix II |
| 2-12 | Microbial metabolism | | Ch 4 |
| 2-17 | Microbial metabolism | | Ch. 4 |
| 2-19 | Growth | | Ch. 9, pages 63-65, 72-76 |
| 2-24 | Growth | | Ch. 9, pages 63-65, 72-76 |
| 2-26 | Growth | | Ch. 9, pages 63-65, 72-76 |
| 3-3 | Microbial genetics | | Ch. 6, 7 |
| 3-5 | Microbial genetics | | Ch. 6, 7 |
| 3-10 | Microbial genetics | | Ch. 6, 7 |
| | Semester midpoint. The last day to withdraw is 3-17 | | |
| 3-12 | Growth control | | Ch. 10 |
| 3-17 | Viruses | | Ch. 8 |
| 3-19**** | Antibiotic resistance discussion you must attend this lecture | | handout, pages 468-485, 490-496 |

SPRING BREAK

| | | | |
|------|----------------------------------|--|---|
| 3-31 | Viruses, genetics | | Ch. 8, pages 488-490 |
| 4-2 | Pathology | | Ch. 13 |
| 4-7 | Bacteria, groups (presentations) | | Chs. 16-2, 17 and 18, appendix I |
| 4-9 | Bacteria, groups (presentations) | | Chs. 16-2, 17 and 18, appendix I |
| 4-16 | Epidemiology | | Ch. 12 |
| 4-21 | Epidemiology | | Ch. 12 |
| 4-23 | Immunology | | Ch. 11 |
| 4-28 | Immunology | | Ch. 11 |
| 4-30 | Immunology | | Ch. 11 |
| 5-5 | HIV | | pages 376-7, 404-5, 489-490 543, 558-9, 608-613, 722-5 |

Final exam: Thursday May 14, 9:30 am