

Current Course Description:

BIOL 304. Microbiology. A study of the structure, physiology and activities of micro-organisms as related to their role in nature, disease, immunological interactions, industrial processes and human affairs. Basic concepts and fundamental techniques for isolation, growth, identification and immunological reactions are stressed. Prerequisites: BIOL 121 and BIOL 122 with minimum grades of C- or permission of instructor. 3 lecture and two 2-hour lab periods. 5 credits. SP.

Proposed New Course Description (**Must match description on course syllabus**):

BIOL 304. Microbiology for the Healthcare Professional. A study of the structure, physiology, and activity of microorganisms as related to their role in nature, disease, and human affairs. This course will examine the key roles of symbiosis with emphasis on the host-pathogen relationship as it affects humans. Basic concepts and fundamental techniques for the isolation, growth, and identification of bacteria and fungi are stressed. This course does not fulfill the Cell and Molecular Area requirement for the biology major (students should take BIOL 305 instead to fulfill that requirement). Either BIOL 304 or BIOL 305 may be used to satisfy elective requirements for the biology major, but no student may take both of these courses. Prerequisites: BIOL 250, or both BIOL 206 and 207. 3 lecture and one 3-hour lab periods. 4 credits.

Delete Course from Catalog

Submit to Storage

Please attach a proposed syllabus in Longwood format that contains proposed changes.

II. Required for Major, Minor, Concentration (please specify):

For catalogs prior to Fall 2016, Biology majors may select this course from several possible options to fulfill requirements in the Health/Biomedical Concentration or it may be used as a BIOL elective course for any concentration in the Biology Major. Beginning with the 2016-2017 catalog, biology majors may take this course as a BIOL elective, but it cannot be used to fulfill the Cell and Molecular Area (“Pillar”) requirement. Students will want to complete a microbiology course for the Cell and Molecular Area requirement will instead take BIOL 305: General Microbiology, a new course specifically designed for Biology Majors.

Also, this course is currently required or can be chosen to fulfill requirements for the Biology Minor, Nursing Major, and the Biophysics Concentration of the Physics Major. The proposed changes should not affect the use of this course for these majors, minors, and concentrations and will hopefully enhance the value of this course for these students. These students would also have the option of taking the new BIOL 305 course instead, though they would need to meet the prerequisites for the course by taking introductory courses for biology majors.

III. Rationale for Proposed Changes:

With this change, and a concurrent change in BIOL 206 and 207 (Human A&P I and II), we are able to ensure that Nursing majors receive all of the information that they need for their major in Human A&P and Microbiology without having to take introductory biology (BIOL 121).

The new biology curriculum is designed to have all Area (“Pillar”) courses reinforce and apply the skills and knowledge obtained from introductory-level courses. Thus, it is necessary to have a separate course for non-biology majors to avoid putting those students at a disadvantage or requiring an excessive number of prerequisites to take the course. For these reasons, we are proposing a new course (BIOL 305 General Microbiology) to fulfill biology major Cell and Molecular Area requirements. This allows us to continue the current BIOL 304 Microbiology as a course that has become tailored to the specific needs of Nursing Majors, by focusing on the topics most relevant to healthcare. By contrast, the new BIOL 305 will have an expanded focus that will also include topics such as genetics, microbial ecology in the global environment, and evolution. This expanded focus will have an increased applicability to a wider range of biological interests and better

coincide with the integrated nature of our new biology curriculum. This separation into BIOL 304 and 305 also allows for an appropriate prerequisite requirement for non-biology majors to be able to register for the course without an override (in our current system, nursing majors typically need an override to register without the BIOL 122 prerequisite).

This course, as well as the new BIOL 305 course, will be reduced to 4 credits by changing from two 2-hour labs per week to having one 3-hour lab per week. This will greatly facilitate scheduling for the nursing and biology majors. Additionally, transfer credit from other institutions generally has 4 credits for a microbiology course and changing the credit hours on our course will eliminate the problem of transfer credit leaving students one credit short of fulfilling our microbiology requirements.

The speaking intensive designation is not needed and it is necessary to remove this to reduce the course to the new 4-credit, one lab a week model.

To avoid confusion for students, the course title is being changed to reflect the course focus and to distinguish this from the new BIOL 305 course.

IV. Resource Assessment, if change warrants it:

A. How frequently do you anticipate offering this course?

Every Spring

B. Describe anticipated change in staffing for the course:

None

C. Estimate the cost of new equipment required due to change:

None

D. Estimate the cost of and describe additional library resources:

None

E. Will the change in the course require additional computer use, hardware or software?

Yes

No

If yes, please describe and estimate cost:

F. Will a new or changed course fee be assessed? Yes

No

SIGNATURE PAGE
UNDERGRADUATE COURSE CHANGE
NON-GENERAL EDUCATION

Course Name/Number BIOL 304 Course Title Microbiology

V. Approvals

- | | Date Received | Date Approved | Signature |
|----------------------------------------------------------------------------|---------------|--------------------------------|-----------|
| 1. Department Curriculum Committee Chair | _____ | _____ | _____ |
| 2. Department Chair | _____ | _____ | _____ |
| The Department Chairs, whose programs may be affected, have been notified: | | | |
| Department <u>Chemistry & Physics</u> | | Date Notified <u>8/27/2015</u> | |
| Department <u>Nursing</u> | | Date Notified <u>8/27/2015</u> | |
| Department _____ | | Date Notified _____ | |
| Department _____ | | Date Notified _____ | |
| 3. College Dean | _____ | _____ | _____ |
| 4. College Curriculum Committee | _____ | _____ | _____ |
| 5. #EPC | _____ | _____ | _____ |
| 6. #Faculty Senate Chair | _____ | _____ | _____ |
| 7. Date received by Registrar | _____ | | |

#EPC & Senate approval required for change in credit hours

All curriculum proposals/changes are processed in the date order received. In order to be included in the next academic year's catalog, all paperwork must be submitted no later than:

February 1st to the College Curriculum Committee
March 1st to the Educational Policy Committee (EPC)

Submission within the deadlines does not guarantee processing in time for the next academic year's catalog.

NEW SYLLABUS

BIOL 304 Microbiology for the Healthcare Professional

COURSE DESCRIPTION:

BIOL 304. *Microbiology for the Healthcare Professional.* A study of the structure, physiology, and activity of microorganisms as related to their role in nature, disease, and human affairs. This course will examine the key roles of symbiosis with emphasis on the host-pathogen relationship as it affects humans. Basic concepts and fundamental techniques for the isolation, growth, and identification of bacteria and fungi are stressed. This course does not fulfill the Cell and Molecular Area requirement for the biology major (students should take BIOL 305 instead to fulfill that requirement). Either BIOL 304 or BIOL 305 may be used to satisfy elective requirements for the biology major, but no student may take both of these courses. Prerequisites: BIOL 250, or both BIOL 206 and 207. 3 lecture and one 3-hour lab periods. 4 credits.

REQUIRED TEXTBOOKS: Tortora, G.L., B.R. Funke, and C.L. Case. 2016. Microbiology: An Introduction (12th ed.) Benj. Cummings Publ., San Francisco, CA

Printed lab notebook 2016/17 Edition.....in Bookstore

COURSE OBJECTIVES: At the conclusion of this course, you will be able to:

- 1) Recognize and describe the cellular components, the means of energy generation and transformation, and the genetic expression of prokaryotic organisms.
- 2) Acknowledge selected contributions of microbial research to medicine, agriculture, industry, the environment, and as models for an increased understanding of life processes, in general.
- 3) Describe the current schemata/framework of bacterial classification.
- 4) To learn and apply the basic techniques of isolation, culture, and identification of bacteria.
- 5) To become proficient at aseptic technique in the handling and manipulation of materials related to microbial study.
- 6) Describe the major components of how a pathogenic relationship/disease state is produced; including its introduction, development, and progression/transmission within and between hosts.
- 7) Describe the variety of virulence factors in pathogenic agents – both bacterial and viral.
- 8) Identify and describe the innate and adaptive components of the human immune system and be able to discuss how they coordinate to protect us from foreign particles – living and otherwise.
- 9) List and describe the major taxa of bacteria and viruses known to affect human health and/or our environment in both positive and negative ways.
- 10) Recognize and describe the variety of and life cycle biology of viruses that are currently catalogued.
- 11) Describe how the overwhelming majority of microorganisms interact positively with the human body (human microbiome) and with other organisms and the environment in the complex functioning of the biosphere.

Honor Code Policy:

I strongly support the Longwood University Honor System and expect you to do likewise. **All written work is to be pledged in full and signed.** Any student found responsible for an Honor Code violation in this course will receive an “F” grade.

COURSE REQUIREMENTS:

THERE WILL BE NO "MAKE-UPS" FOR EXAMS, TESTS OR QUIZZES. ALL TESTS WILL BE GIVEN AT THE TIME AND DATE SCHEDULED.

Course grading will be comprised of:

- A) three tests** given approximately every four (4) weeks
- B) final examination (comprehensive)**
- C) in-class quizzes**
- D) laboratory component**
- E) attendance**

Tardiness and Absences:

Class attendance and punctuality are strongly emphasized, as there is a high correlation between course performance and attendance in this class. Attendance will be taken at the beginning of class. Any student not present when roll is taken will be considered absent. If a student arrives after roll is called, it is the responsibility of the student to personally inform the instructor of his/her presence as soon as class is over. The instructor will adhere to Longwood's policy of applying an "F" grade for any student who misses more than 25% of the class meetings (**excused or unexcused, lecture and lab combined**). An absent or tardy student will also be held accountable for all materials missed during absence(s).

The instructor assumes all students taking Microbiology are seriously interested in successfully completing Longwood's BSRN program and desire to tailor their priorities pursuant to that goal.

COURSE EVALUATION:

The final grade will be determined as follows:

| | <u>approx. %</u> |
|---------------------------------|-------------------------|
| three tests @ 100 pts each | 300 points (27%) |
| the final examination | 200 points (18%) |
| top ten quizzes @ 10 pts each | 100 points (9%) |
| <u>the laboratory component</u> | <u>450 points (45%)</u> |
| total points possible | 1050 points (100%) |

Grading Scale:

| | |
|-----------|------------------|
| A | 93-100% |
| A- | 90-93% |
| B+ | 87-90% |
| B | 83-87% |
| B- | 80-83% |
| C+ | 77-80% |
| C | 73-77% |
| C- | 70-73% |
| D+ | 67-70% |
| D | 63-67% |
| D- | 60-63% |
| F | Below 60% |

COURSE OUTLINE AND SCHEDULE:

Some of the topics as well as the sequence of those topics are subject to change. Exams may include more or less material than is listed in the schedule depending on how closely we adhere to this outline.....

| Week: | Lecture Topic: | Laboratory |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Week 1 | The Microbial World and You Development of Microbiology as a Science Chapter 1: pgs 1-23 | Introduction to and Use of Leica DME Microscopes; Simple Staining and viewing bacteria |
| Week 2 | Functional Anatomy of Prokaryotic and Eukaryotic Cells Chap 4: 72-94 | Differential Staining; the Gram Stain and the Acid-Fast Stain applications |
| Week 3 | Requirements for Microbial Growth Chap 6: 149-156 | Aseptic Technique and Cell culture transfers; Pure culture isolation techniques |
| Week 4 | Microbial growth kinetics Chap 6: 163-172 *****TEST ONE***** | Introduction to Diagnostic plate culturing for microbial identification |
| Week 5 | Microbial Metabolism Chap 5: 107-133 | Multiple testing technologies; Blood agars and Hemolytic reactions |
| Week 6 | Epidemiology Microbial Mechanisms of Pathogenicity Chaps 14/15: 390-407; 417-430 | Review for Lab Practical |
| Week 7 | Innate Immunity/Nonspecific Defenses of the Host Chap 16: 439-458 Mid-term grades due *****TEST TWO***** | Lab Practical and Written Test |
| Week 8 | Spring Break – no classes | |
| Week 9 | Adaptive Immunity/Specific Defenses of the Host Chap 17: 468-488 Last day to withdraw with “W” | Antibiotic Sensitivity testing; assignment of Bacterial Unknowns project |
| Week 10 | Bacteria of Medical, Industrial and Environmental Significance selected portions of Chapters 21-26; Appendix F | Antigen/Antibody titres: Precipitin analysis using RID and Ouchterlony plates |
| Week 11 | Bacterial survey continued Selected portions of Chapters 21-26; Appendix F | Serological tests: ELISA testing |
| Week 12 discussions | Viruses, viroids, and prions Chap 13: 358-380 *****TEST THREE***** | Presentation of term projects and lab |
| Week 13 discussions | DNA vs RNA viruses | Presentation of term projects and lab |
| Week 14 | Course Wrap-up Last day of class Final Exam date/time | Final Lab Test |

OLD SYLLABUS

BIOL 304.01

Microbiology

Fall Term 2015

TIME: MWF 11:00 – 11:50 a.m. lectures in Rm 222 Chichester
MW 2:00 – 3:40 p.m. laboratories

INSTRUCTOR: Dr. David Buckalew
OFFICE: Room 305D Chichester Sciences Center
PHONE: 395-2586
E-MAIL: buckalewdw@longwood.edu
OFFICE HOURS: As posted (T/R 10:00 – 12:00noon; W 4:00-5:00pm) and/or by appointment

COURSE DESCRIPTION: A study of the structure, physiology, and activity of microorganisms as related to their role in nature, disease, industrial processes, and human affairs. Basic concepts and fundamental techniques for the isolation, growth, and identification of bacteria and fungi are stressed. Two lectures and two 2-hour lab periods per week. 5 credits.

REQUIRED TEXTBOOKS: Tortora, G.L. et al. 2015. **Microbiology: An Introduction** (12th ed.) Pearson Publ., San Francisco, CA

Printed lab notebook 2015/16 Ed.....in Bookstore

COURSE OBJECTIVES:

- 1) Recognize and describe the cellular components, the means of energy generation and transformation, and the genetic expression of prokaryotic organisms.
- 2) Gain an appreciation for their collective contributions to medicine, agriculture, industry, the environment, and as models for an increased understanding of life processes, in general.
- 3) Describe the current schemata/framework of bacterial classification.
- 4) To learn and apply the basic techniques of isolation, culture, and identification of bacteria.
- 5) To become proficient at aseptic technique in the handling and manipulation of materials related to microbial study.
- 6) Describe the major components of how a pathogenic relationship/disease state is produced; including its introduction, development, and transmission within and between hosts.
- 7) Describe the variety of virulence factors in pathogenic agents – both bacterial and viral.
- 8) Identify and describe the innate and adaptive components of the human immune system and be able to discuss how they coordinate to protect us from foreign particles – living and otherwise.
- 9) List and describe the major taxa of bacteria and viruses known to affect human health and/or our environment in both positive and negative ways.
- 10) Recognize and describe the variety of and life cycle biology of viruses that are currently catalogued.
- 11) Describe how the overwhelming majority of microorganisms interact positively with other organisms and the environment in the complex functioning of the biosphere.

COURSE REQUIREMENTS:

Course grading will be comprised of:

- A) **three tests** given approximately every four (4) weeks
- B) **final examination (comprehensive)** scheduled for **Monday, Dec 7, 2015**
- C) **in-class quizzes**
- D) **laboratory component (to include term project/presentation)**

Tardiness and Absences:

Class attendance and punctuality are strongly emphasized, as there is a high correlation between course performance and attendance in this class and most especially labs. Attendance for class is not usually recorded unless there is/are a case(s) of chronic absence. The instructor will adhere to Longwood's policy of applying an "F" grade for any student who misses more than 25% (11 absences) of the class meetings (**lecture and/or lab combined**). An absent or tardy student will also be held accountable for all materials missed during absence(s).

The instructor assumes all students taking Microbiology are seriously interested in becoming well-trained biologists and/or successfully completing Longwood's BSRN program and who desire to tailor their priorities pursuant to that goal.

COURSE EVALUATION:

The final grade will be determined as follows:

| | <u>approx. %</u> |
|---------------------------------|-------------------------|
| three tests @ 100 pts. each | 300 points (27%) |
| the final examination | 200 points (18%) |
| ten quizzes @ 10 pts each | 100 points (9%) |
| <u>the laboratory component</u> | <u>500 points (45%)</u> |
| total points possible | 1100 points (100%) |

Grading Scale:

| <u>Points/Percentage</u> | <u>Final Grade</u> |
|---------------------------|--------------------|
| 990 and above (90 - 100%) | A |
| 968 - 989 (88 - 90%) | B+ |
| 913 - 967 (83 - 87%) | B |
| 880 - 912 (80 - 82%) | B- |
| 858 - 879 (78 - 80%) | C+ |
| 803 - 857 (73 - 77%) | C |
| 770 - 802 (70 - 72%) | C- |
| 660 - 769 (60 - 69%) | D |
| below 660 (below 60%) | F |

Some tips on studying: (taken from: <http://www.cse.buffalo.edu/~rapaport/howtostudy.html>)

- 1) **Studying is not the same as 'doing homework'**. It actually is much more than that!
- 2) **Manage your time.** Being a science major is a full-time job.
If you have a side job or get involved with extra-curricular activities, then remember that your education should come first. Do not cram for exams.
- 3) **Take notes in class and then re-write at home.** Note-taking is a skill that is learned as it usually requires fast writing and use of abbrev. Asking questions and putting comments in the margins help with understanding later. Do not take notes on a computer. Do not rely upon the Instructor's lecture notes/PowerPoint slides as your sole source of notes for taking tests.
- 4) **Read your textbook before and after classes.** You paid a lot for the textbook – please use it!
- 5) **Keep a notebook with notes and comments.** Keeping a good record of classroom lectures and discussions is of utmost importance to your success in this course.
- 6) **Make flash cards if they help.** Intro courses are, by nature, jargon intensive – so get right with the terminology!
- 7) **Make up sample questions and/or essays and diagrams.**

Cell/smart phone policy:

Any student using a cellular device for texting purposes during either lecture or laboratory discussions of this course will be docked a 1 percentage point reduction in final grade score for each infraction.

THERE WILL BE NO "MAKE-UPS" FOR EXAMS, TESTS OR QUIZZES. ALL TESTS WILL BE GIVEN AT THE TIME AND DATE SCHEDULED.

Honor Code Policy:

I strongly support the Longwood University Honor System and expect you to do likewise. **All written work is considered to be pledged in full.** Any student found responsible for an Honor Code violation in this course will receive a "0" for the assignment which may result in a failing grade for the course.

LECTURE OUTLINE AND SCHEDULE:

Some of the topics as well as the sequence of those topics are subject to change. Exams may include more or less material than is listed in the schedule depending on how closely we adhere to this outline.....

| Week of: | Topic: | Chapters: pages |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|
| Aug 24 | The Microbial World and You Development of Microbiology as a Science | 1: 1-23 |
| Aug 31 | Functional Anatomy of Prokaryotic and Eukaryotic Cells | 4: 72-94 |
| Last day Add/Drop | | |
| Sept 7 | Requirements for Microbial Growth | 6: 149-156 |
| Sept 14 | Microbial growth kinetics | 6: 163-172 |
| *****TEST ONE*****Friday, Sept 18 ***** | | |
| Sept 21 | Microbial Metabolism | 5: 107-133 |
| Sept 28 | Epidemiology Microbial Mechanisms of Pathogenicity | 14/15: 390-407; 417-430 |
| Oct 5 | Innate Immunity – Nonspecific Defenses of the Host Mid-term grades due | 16: 439-458 |
| Oct 12 | Fall Break – Mon/Tues | |
| Oct 14 | Last Day to Withdraw with a "W" | |
| *****TEST TWO*****Friday, Oct 16 ***** | | |
| Oct 19 | Adaptive Immunity – Specific Defenses of the Host | 17: 468-488 |
| Oct 26 | Bacteria of Medical, Industrial and Environmental Significance (Gram negatives) – Bergey's Manual | 11, 21-26 Appendix F |
| Nov 2 | Microbial Survey (Gram negatives) | 21-26 |
| Nov 9 | Microbial Survey (Gram positives) | 21-26 |
| *****TEST THREE*****Friday, Nov 13 ***** | | |
| Nov 16 | Microbial Genetics | 8: 201-232 |
| Nov 23 | Viruses, viroids, and prions | 13: 358-380 |

| | |
|--------------|-----------------------------------|
| Nov 30 | DNA vs RNA viruses |
| Dec 4 | Last day of class |
| Dec 7 | Final Exam 8:00 – 10:30 AM |

**BIOL 304.01
Microbiology Laboratory
Fall 2015
Longwood University
Course Syllabus**

Instructor: Dr. David W. Buckalew
Office: 305D Sciences
395-2586

Office hours: As posted or by appointment
Email: buckalewdw@longwood.edu

Text: Printed lab notebook available in the Longwood bookstore.

Course Description: A study of the structure, physiology and activities of micro-organisms as related to their role in nature, disease, immunologic interactions, industrial processes, and human affairs. Basic concepts and fundamental techniques for isolation, growth, identification and research are stressed. Two 2-hour labs periods per week. Significant portion of 5 credit course.

Objectives:

1. Interpret and describe the logical framework of tests related to microbial classification using plate-based methodologies.
2. Recognize and mechanically perform methods for the isolation, cultivation, and identification of microorganisms and gain proficiency in such techniques used in basic research, medicine, and industry.
3. Interpret and discuss the results of diagnostic testing schemes related to the classification of common bacterial species associated with humans.
4. Interpret and discuss the results of a variety of applied research methods used in the field of microbiology.

Course Requirements:

There are several categories of assignments used to assess student performance in the micro laboratory for this course. They include: **data sheets, term project, independent identification of bacterial unknowns, and two exams.**

1) **Data Sheets:** Periodically, you will be asked to present and interpret data and answer selected questions on a data sheet. These sheets will be assigned and submitted for five (5) of the lab exercises. They will be due on a specific day and time as required by the instructor. Late data sheets will not be accepted. Data sheets are to be a student's own work.

2) **Term Project:** The term project theme will be selected by the instructor, discussed and assigned within the first few weeks of the semester. Specific topics for each individual's presentation need to be submitted to the instructor for approval. Topics will be chosen on a first-come, first-served basis.

3) **Bacterial Unknowns:** After mid-term and after having experience with critical lab exercises focusing on aseptic technique and pure culture isolation and the basics of diagnostic testing for bacterial identification, each student will be

given a mixture of two (2) bacterial species in which s/he will have to determine correct identity. The specific rules for this determination will be discussed in the lab and are printed at the back of the lab manual.

4) **Exams.** Since the study of microbiology is a practical, hands-on experience, it lends itself to a wide variety of practical exam questions. In light of this, some portion of the mid-term and final exams will be practical in nature. More information on possible practical exam questions will be discussed during the lab periods preceding exam dates.

Evaluation and Grading

The tabulation of points will include:

| | |
|--------------------------------------------|-------------------|
| Five (5) data sheets of lab exercises..... | 50 points |
| Term presentations..... | 150 points |
| Bacterial Unknown..... | 50 points |
| Mid-term exam..... | 150 points |
| <u>Final exam.....</u> | <u>100 points</u> |
| Total points possible..... | 500 points |

Tardiness and Absences:

Class attendance and punctuality are strongly emphasized. **Please refer to the lecture syllabus for discussion on this topic.**

Honor Code

I strongly support the Longwood University Honor System and expect you to do likewise. All written work is considered to be pledged in full. Any student found responsible for an Honor Code violation in this laboratory will receive an "F" grade for the entire course.

Additional Note:

The safety and housekeeping policies discussed in the lab introduction and any similar instructions given toward that end must be adhered to faithfully. Consumption of food or drink in the lab is not allowed. Cultures of live, pathogenic organisms are used in this course thus requiring high levels of concentration, attention to detail, and precise identification and labeling of culture vessels.

Observation of cultures (typically within 24 hrs of inoculation) outside of scheduled lab times is required for this course.

Course Outline and Schedule...BIOL 304 Microbiology laboratory. Fall 2015

| <u>Week of:</u> | <u>Exercise</u> |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aug 24 | 1. Introduction; Use and Care of the Microscopes Library research guides and referencing; term projects intro |
| Aug 31 | 2. Stains and Simple Staining of bacteria Discussion and choice of term project ideas |
| Sept 7 | 3. Differential Staining – the Gram Stain Discussion of term project presentations |
| Sept 14 | 4. Aseptic Technique and Transfer of Cell Cultures Streak Plating and Pure Culture Isolation |
| Sept 21 | 5. Differential/Selective Media (EMB, MacConkey, BEA, PEA, MSA, etc.) Blood agars and Hemolytic reactions |
| Sept 28 | 6. Diagnostic Physiology and Bacterial Identification The IMViC test, Oxidase, Catalase, Coagulase APA test strips/Enterotube II – multiple tests |
| Oct 5 | 7. Review and Mid-term Lab Practical/Written Exam |
| Oct 12 | 8. <u>Fall Break (Monday)</u> Assignment of Bacterial Unknowns – Rules, etc. Due: Nov 6. |
| Oct 19 | 9. Antibiotic sensitivity testing – the Kirby Bauer technique Discussion of antibiotic resistance |
| Oct 26 | 10. Antigen/Antibody titres: Precipitin Analysis Serological testing: The ELISA test |
| Nov 2 | 11. Microbiologic assessment of water quality |
| Nov 9 | 12. <u>Presentation of term projects</u> |
| Nov 16 | 14. <u>Presentation of term projects</u> |
| Nov 23 | 15. Thanksgiving Week |
| Nov 30 | 16. Review and Final Lab Examination |

