UNIVERSITY OF HAWAII COMMUNITY COLLEGES
PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE

1. TYPE OF ACTION
   A. Addition  [X] Regular  [ ] Experimental  [ ] Other  
   B. Deletion  [ ] in credits  [ ] in title  [ ] in number or alpha  [ ] in prerequisites  [ ] Other  
   C. Modification  [ ] in credits  [ ] in title  [ ] in number or alpha  [ ] in prerequisites  [ ] Other  

2. NEW ALPHA, NUMBER AND TITLE  MICRO 140

3. CREDITS  2

4. OLD ALPHA, NUMBER AND TITLE

5. CREDITS

6. NEW CATALOG DESCRIPTION  Laboratory course illustrating fundamental techniques and concepts of microbiology, such as microscopy, aseptic culture methods, microorganism classification and identification, environmental factors influencing microorganisms, biochemistry of microorganisms, (see attached)

7. PREREQUISITES  credit or concurrent registration in MICRO 130; eligibility for placement in MATH 24

8. STUDENT CONTACT HOURS PER WEEK
   Lecture  [ ]  Lecture/Lab  [ ]  Lab  [X]  Other  (specify)  

9. PROPOSED DATE OF FIRST OFFERING  Spring 1998

10. THIS COURSE  [ ] IS REQUIRED  [ ] IS AN ELECTIVE FOR THE WCC PROGRAM/CORE  
    [X] CAN FULFILL  WCC Natural Science Core as a biological requirement  
    (Please specify)  science lab course

11. THIS COURSE  [ ] INCREASES  [ ] DECREASES  [X] MAKES NO CHANGE IN NUMBER OF CREDITS REQUIRED FOR THE PROGRAM/CORE

12. SIMILAR COURSES OFFERED ELSEWHERE:  **see also attached sheet

   College(s):
   [ ] UHM
   [ ] UHH
   [ ] HawCC

   Alpha, Number, Title:
   MICRO 140 General Microbiology Laboratory
   BIOL 275/275L Fund of Microbiology
   MICRO 130L Microbiology Lab

13. THIS COURSE IS
   [ ] ALREADY ARTICULATED with  
   [X] APPROPRIATE FOR ARTICULATION with  See list #12 above ARTICULATION
   [ ] NOT YET APPROPRIATE FOR

   (Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.)

   MICRO 140 at WCC should be articulated all courses and campuses listed in #12 above.

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:  The lack of a companion laboratory course to our MICRO 130 has detriment to the science program and the students served by it. Our new science facility allows us to correct this deficiency.

REQUESTED BY:  
[Signature]  Date  2/8/97
Department Chairperson

APPROVED BY:  
[Signature]  Date  6/21/97
Curriculum Committee

[Signature]  Date  6/4/97
Faculty Senate

[Signature]  Date  6/5/97
Dean of Instruction

[Signature]  Date  3/24/98
Provost

Change recorded by Catalog Preparer  Date

CCCM #6100
(Amended for WCC use Sept. 1991)
6. NEW CATALOG DESCRIPTION (continued)

ecological microbiology, and medical microbiology. This course is designed to complement MICRO 130. Primarily for students in nursing, dental hygiene, and nutrition.

12. SIMILAR COURSES OFFERED ELSEWHERE (continued)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
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<tbody>
<tr>
<td>HonCC</td>
<td>MICRO 140 General Microbiology Laboratory</td>
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<tr>
<td>KapCC</td>
<td>MICRO 140 General Microbiology Laboratory</td>
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<tr>
<td>KauCC</td>
<td>MICRO 140 Microbiology Laboratory</td>
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<tr>
<td>LCC</td>
<td>MICRO 140 General Microbiology Laboratory</td>
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<tr>
<td>MCC</td>
<td>MICRO 130L General Microbiology Laboratory</td>
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# Levels of Review of Course Proposals at WCC

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Subject Area (one or more instructors in the area)</strong></td>
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</tr>
<tr>
<td>Joseph E. Ofill</td>
<td>9/3/97</td>
</tr>
<tr>
<td>Mal</td>
<td>9/8/97</td>
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<tr>
<td></td>
<td>9/18/97</td>
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<tr>
<td></td>
<td>9/8-97</td>
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</tbody>
</table>

| **2. Department** | |
| Josephine Male | 9-8-97 |
| Department Chairperson | |
| Was this course discussed in a dept. mtg. | Yes | 9-4-97 |

| **3. Division** | |
| | 9-10-97 |
| Assistant Dean of Instruction | |

| **4. Curriculum Committee Review** | |
| Approved | X | |
| Disapproved | | |
| Reason: | |

| | |
| | 10/21/97 |
| Curriculum Committee Chairperson | |
1. How is this course related to the educational needs and goals of the College/Department/Community as reflected in the EDP?
The Department of Natural Sciences has wanted to offer MICRO 140 for many years so that we could offer more courses that would be useful to students interested in health sciences degree programs. Unfortunately, our facilities limited our ability to offer MICRO 140. Our new science building gives us the opportunity to correct this deficit. MICRO 140 also fulfills the 1996-2002 ADP goal B.1. by enhancing the Liberal Arts course offerings.

2. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial support that would be required to implement this course. (Include an estimate of the actual cost of supplies and equipment.) What has been done to provide for these additional costs for the proposed date of offering? Who will teach the course?
Initially this class would be taught in place of another natural science class (alternating offerings). Eventually, however, a full-time tenured faculty position in Botany/Microbiology will take on this class as part of his or her regular workload. This position is specified by the EDP. Initial start up costs to purchase new reusable supplies and equipment will be necessary (ca. $2700).

3. Is a similar course taught elsewhere in the UH system? yes
If yes, provide details of how this course differs from existing similar courses.
no significant difference in course content

4. Is this course experimental and/or unique to Windward Community College? no
If yes, provide rationale and details of its impact on the College curriculum.

5. Is a similar course taught on the upper division level by a 4-year UH college? no
If yes, explain why this course is appropriate at the lower division or how it differs from its upper division counterpart.

6. Please attach a complete course outline. Your course outline should address all the items listed in the Guidelines for Course Outlines.

7. If this course is numbered 100 or above or appropriate for transfer to a 4-year college, complete and attach WCC Form for Transfer Courses (blue). (See attached criteria for transfer courses.)
WINDWARD COMMUNITY COLLEGE

OUTLINE OF COURSE OBJECTIVES

COURSE NAME: Microbiology Laboratory
COURSE ALPHA: MICRO 140
CREDIT HOURS: 02

CATALOG DESCRIPTION:

Laboratory course illustrating fundamental techniques and concepts of microbiology, such as microscopy, aseptic culture methods, microorganism classification and identification, environmental factors influencing microorganisms, biochemistry of microorganisms, ecological microbiology, and medical microbiology. This course is designed to complement MICRO 130. Primarily for students in nursing, dental hygiene, and nutrition. Science laboratory course (two 2-hr Lab).

REQUIREMENTS COURSE SATISFIES

AT WCC: A.A. Degree natural science requirement for a biological science (Natural Science Group 1) and a laboratory science class.

AT UHM: Baccalaureate Degree General Education Core Requirement for a biological science (NS1) and a laboratory science class; required for School of Nursing programs in Dental Hygiene and Nursing; prerequisite for some Food Science and Human Nutrition classes.

PREREQUISITES:

Credit or concurrent registration in MICRO 130; Eligibility for placement in MATH 24.

RECOMMENDED SPECIAL PREPARATION:

High school biology, high school chemistry, and MATH 25.

ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES:

Students will need to inspect status of microorganism cultures and carry out some laboratory procedures on their own at times other than scheduled laboratory periods.

INSTRUCTOR:

OFFICE:

TELEPHONE:

EFFECTIVE DATE: Spring 1998
COURSE GOALS

Upon completion of this course, you should have basic understanding and technical competency in the standard techniques for the isolation, culture, identification, quantification, and control of microorganisms.

COURSE OBJECTIVES

The student will demonstrate knowledge and understanding of the theories and principles of microbiology laboratory methods in the following topic areas: microscopy (use of the microscope, slide preparation, staining, etc.), classification of microorganisms (e.g., bacteria, protozoa, algae, fungi and microscopic metazoans), aseptic culture methods (media preparation, aseptic transfers, isolation, culture maintenance, etc.), environmental influences (e.g., temperature, ultraviolet light, antiseptics, disinfectants, and antibiotics), biochemical activities of microorganisms (e.g., fermentation, nitrate reduction, hydrogen sulfide production, dehydrogenase activity, urease activity, exoenzyme activity, etc.), ecological microbiology (e.g., analyses of coliforms from natural waters), and isolation/identification of microorganisms.

The student will also demonstrate the acquisition of microbiology laboratory skills by (1) the establishment and proper maintenance of two stock cultures throughout the semester and (2) the identification of two bacterial unknowns.

EVALUATION OF OBJECTIVE ACHIEVEMENT

The evaluation of the student's achievement of the course objectives will be based upon laboratory participation, laboratory reports, the ability to maintain microorganisms in culture, the ability to identify microorganisms, and examinations as described below.

Laboratory Participation

The student will actively participate in all lab activities (50 points). The student is also expected work safely and efficiently in the laboratory. Thus the student will be graded on laboratory attendance, level of participation, and laboratory work habits. Because of the difficulties in setting up laboratory materials, students missing a regularly scheduled laboratory activity for a legitimate reason (e.g., illness or family emergency) may be given an alternative assignment related to the activity. Failure to participate in a scheduled laboratory session, or its approved make up activity, will result in a 15 POINT DEDUCTION for each session missed. STUDENTS MISSING MORE THAN FOUR TWO-HOUR LABORATORY SESSIONS WILL NOT RECEIVE CREDIT FOR THE COURSE.

Laboratory Reports

The student will complete a total of six written formal laboratory reports (20 points each). Each assignment must be completed and turned no later than the first laboratory meeting after the lab work was completed (120 points total). The format for these formal reports will be explained in class.
Stock Culture Maintenance

The student will maintain two different stock cultures of bacteria using procedures learned in this laboratory course (25 points for each culture). Assessment will be based upon the purity and healthy of the cultures at the end of the semester.

Identification of Bacterial Unknowns

Using methods learned in this course (e.g., colony characteristics, cellular characteristics, differential staining and growth in differential), the student will identify two different kinds of unknown bacteria (25 points for each unknown).

Unit Examinations

The student will take a total of four unit examinations (25 points each) to assess the student's knowledge and understanding of previous laboratory activities (generally not cumulative). One or two questions regarding that day's laboratory activities may be included.

Final Examination

The student will take a cumulative final examination (80 points) to demonstrate understanding and practice of the microbiological concepts and methodologies presented in this course.

METHOD OF GRADING

The assignment of points will be as described by the following protocol:

- Laboratory Participation.............5 0 points
- Laboratory Reports (6)..............1 2 0 points
- Culture Maintenance (2).............5 0 points
- Bacteria Identifications (2)...........5 0 points
- Unit Examinations (4)...............1 0 0 points
- Final Examination.....................8 0 points
- TOTAL.....................................4 5 0 points

Letter grades will be assigned as follows:

- A - - - 90% or above in total points.
- B - - - 80-89% of total points.
- C - - - 65-79% of total points.
- D - - - 55-64% of total points.
- F - - - Below 55% of total points; or incomplete official withdrawal from course.
- I - - - Incomplete; given at the INSTRUCTOR'S OPTION when the student is unable to complete a small part of the course because of circumstances beyond his or her control. It is the STUDENT'S responsibility to make up incomplete work with a minimum level (or better) of achievement. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for "I" to the contingency grade identified by the instructor (see catalog).
CR - 65% or above in total points; the student must indicate the intent to take the course as CR/NC in writing by the end of the 10th week of classes (see catalog).

NC - Below 65% of total points; for MICRO 140, this grade only available under the CR/NC option (see above and see catalog); the NC grade will not be used as an alternative grade for an "F".

N - NOT GIVEN BY THIS INSTRUCTOR EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES (e.g., documented serious illness or emergency that prevents the student from officially withdrawing from the course); never used as an alternative for an "F" grade;

W - Official withdrawal from the course after the third week and prior to the end of the 10th week of classes (see catalog).

The instructor may announce extra credit options at various times during the course. THE INSTRUCTOR IS NOT OBLIGATED TO ACCEPT PROJECTS FOR EXTRA CREDIT.

Waiver of minimum level of achievement will be given only in unique situations at the instructor's discretion.

Students involved in academic dishonesty will receive an "F" grade for the course.

STUDENT RESPONSIBILITIES

Students should carefully review the attached sheet detailing the inherently dangerous activities of this course and sign the appropriate U.H. Assumption of Risk and Release and Medical Consent forms.

Students are expected to attend all laboratory sessions and participate in all activities and complete all course assignments on time.

Students are expected to be prepared in advance when they arrive to class. Being prepared includes the following: having already read text materials (e.g., lab manual, textbook, and handouts) assigned for that day's activities; and bringing required work materials (e.g., writing supplies, textbooks, etc.).

Any changes in the course schedule, such as examination dates, deadlines, etc., will be announced ahead of time in class. It is the student's responsibility to be informed of these changes.

It is the student's responsibility to be informed about deadlines critical to making registration changes (e.g., last day of erase period and last day for making an official withdrawal.

The student should understand MICRO 140 is rigorous class requiring serious attention and study. While the instructor assumes that students enrolled in MICRO 140 have little or no science backgrounds, the students should expect a level of difficulty comparable to other introductory science classes for pre-professionals. When difficult concepts and detailed information are presented, it is the student's responsibility to take the appropriate steps to learn and understand these concepts and information.

Science courses at W.C.C. generally require two to three hours of independent private study time for each hour in class (depends upon the student's science background). It is the student's responsibility to allocate the appropriate time needed for study in an
environment conducive to quality study. The student must budget time efficiently and be realistic about all personal and professional commitments that consume time.

HOW TO SUCCEED IN THIS CLASS

Understanding microbiology involves understanding many difficult concepts and vocabulary from many science disciplines, not just knowing facts. You should know that the details to these concepts are important. In addition, you will be introduced to hundreds of new words. In some cases, words that are familiar to you in a context other than biology will be introduced to you. However, you will need to understand and use these terms in an biological context.

You should take careful pre-lab notes and read the corresponding material in the textbook and lab manual. As soon as possible (best if you do it the same day), copy over your notes filling in gaps and missing information by referring to the lab manual and textbook. You should carefully review these rewritten notes as often as possible. In addition to reviewing these notes before an exam, it would be useful to try to rewrite these notes from memory.

In addition to copying over your notes, your study activities should include drawing your own labeled diagrams or graphs that illustrate important concepts or details. These diagrams need not be works of art, but should clearly illustrate significant information. Before an exam, it would be useful to redraw these labeled diagrams and graphs from memory.

Make flashcards for each new vocabulary word you learn (refer to study guides provided for a list of terms). On one side write the word. On the other side write the appropriate oceanographic definition for the word. Test your ability to provide the right definition as often as possible. Practice using the word to explain microbiology concepts.

Write out answers to all lab manual questions as though you were required to turn them all in. Allow someone else to read your answers and give you feedback. Read someone else's answers and provide constructive feedback.

Read the lab manual and textbook materials corresponding to a particular laboratory before and after that laboratory. Review this material before exams.

TEXTBOOK AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS


OTHER INFORMATION

Important Dates:

Last day to add or drop a class..............................
Last day of erase period.................................
Last day for official withdrawal.........................

Instructor's Office Hours (or by appointment):
MICRO 140 LABORATORY ACTIVITIES

Students enrolled in MICRO 140 are advised that certain required course activities are inherently dangerous and may require normal physical abilities. Students are therefore required to read about the inherently dangerous activities described below. In addition, students must read and demonstrate knowledge of their responsibilities while engaged in these activities.

Some students may have physical conditions that restrict their participation in certain laboratory activities. Respiratory ailments, certain allergies, and pregnancy may be among these conditions. Students exhibiting any of these conditions, or any other condition that may be impacted adversely by participation in the activity, should consult a physician.

INHERENTLY DANGEROUS ACTIVITIES IN THE MICROBIOLOGY LABORATORY

Students may be exposed to chemicals (e.g., formaldehyde, organic solvents, acids, and other caustic chemicals), chemical fumes, laboratory equipment and supplies (e.g., scapels, razor blades, glass slides, coverslips, and electrical equipment), infectious microorganisms, toxic or irritating properties of living and dead animals, human organic matter (e.g., saliva and blood), and other materials necessary to laboratory activities of this or other laboratory classes. Other possible hazards include broken glass on the floor or counters, combustible materials (e.g., bunsen burner gas), and slippery spills.

RESPONSIBLITIES OF STUDENTS IN THE MICROBIOLOGY LABORATORY

1. Students should be familiar with safety procedures and take appropriate precautions at all times to insure the safety of every student in the lab.

2. Students are required to wear appropriate attire at the laboratory. Closed-toe shoes are required at all times. A laboratory coat, safety glasses, and/or protective gloves may be required for certain laboratory activities.

3. Students should follow instructions carefully, especially when hazardous conditions occur or hazardous materials are being used.

4. Students should locate the placement of safety equipment and supplies in the laboratory: safety shower, eye wash station, fire extinguisher, and first aid kit. Students should understand the use of this equipment. Also note the locations of exits.

5. Anyone injured in the lab, should inform the instructor immediately and take immediate action to reduce the risk of further injury.

6. Students should familiarize themselves with the fire procedures. Extinguish small fires, but leave the building immediately should a major fire occur. Notify the appropriate authorities -- don't assume someone else remembered to do it. Meet with other students and your instructor outside the building before leaving so that an accurate headcount may be made.

7. Students should report all hazardous conditions to the instructor immediately.
8. Chemicals may be poisonous, corrosive, or flammable. No chemicals, even chemicals known to be safe, should be ingested, inhaled, or touched unless specifically directed to do so by your instructor.

9. All organisms, living or dead, should be treated with care and respect. Avoid direct handling when possible.

10. The safe use of specific equipment and tools (e.g., microscopes, slides, scalpels, and pipettes) will be demonstrated by the instructor during the laboratory sessions. Students should be sure they understand this usage.

11. Broken glass and sharp metal waste should be placed only in those receptacles marked for such disposal -- do not put these materials in normal trash receptacles.

12. Some chemical wastes may not be dumped into laboratory sinks. In such circumstances an appropriate container will be provided for this waste in the lab.

13. Organic waste resulting from animal dissection activities should be disposed of in the appropriate receptacle, not the ordinary trash receptacles.

14. Human organic materials (e.g., saliva and blood) and other potentially infectious materials (e.g., microorganism cultures) must be disposed of in such a way as to eliminate any possibility for contamination and the spread of disease. Appropriate handling and disposal procedures will be explained when these materials are involved in the laboratory exercise.

15. Students should clean up any supplies used and should return materials where they belong as instructed. Any material spilled should be cleaned appropriately. Report and hazardous spills or breakages.

16. Students should clean up their work areas. This clean up will require use of a chemical disinfectant after working with living materials.

17. After completing laboratory activities and clean up, students should wash their hands in the designated sink to avoid spreading contamination and hazardous chemicals.

18. The laboratory is a place for learning. Therefore, eating, drinking, and playing around is prohibited during the laboratory session. Students exhibiting unsafe or inappropriate behavior in the lab may be asked to leave and may be given an "F" grade for the course.
## SCHEDULE OF LABORATORY ACTIVITIES

<table>
<thead>
<tr>
<th>LAB DAY</th>
<th>LABORATORY ACTIVITY DESCRIPTION</th>
<th>MODULES</th>
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<tr>
<td>1</td>
<td>Introduction/Orientation</td>
<td>Handout</td>
</tr>
<tr>
<td>2</td>
<td>Ubiquity of Microorganisms</td>
<td>6</td>
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<tr>
<td>3</td>
<td>Ubiquity of Microorganisms</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Principles of Microscopy and Slide Preparation</td>
<td>4 &amp; 5</td>
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<tr>
<td>5</td>
<td>Principles of Microscopy and Slide Preparation</td>
<td>4 &amp; 5</td>
</tr>
<tr>
<td>6</td>
<td>Aseptic Techniques and Media Preparation</td>
<td>7, 8 &amp; 9</td>
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<tr>
<td>7</td>
<td>Aseptic Techniques and Media Preparation</td>
<td>7, 8 &amp; 9</td>
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<tr>
<td>8</td>
<td>UNIT EXAMINATION 1</td>
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<td></td>
<td>Streaking for Isolation</td>
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<td>9</td>
<td>Cultural Characteristics (inoculation)</td>
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<td>10</td>
<td>Temperature Effects on Bacterial Growth</td>
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<td>11</td>
<td>Oxygen Requirements</td>
<td>2, 8</td>
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<td></td>
<td>Effects of Ultraviolet Radiation on Bacterial Growth</td>
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<td>12</td>
<td>Smears, Simple Stains, and Gram Stains</td>
<td>21, 22 &amp; 23</td>
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<td>13</td>
<td>UNIT EXAMINATION 2</td>
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<td>Capsule Stain, Endospore Stain, Acid-Fast Stain</td>
<td>24, 25 &amp; 27</td>
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<td>14</td>
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<td>24, 25 &amp; 27</td>
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<td>15</td>
<td>Exoenzymes</td>
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<td>Carbohydrate Fermentation</td>
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<td>Nitrate Reductions</td>
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<td>Urea Hydrolysis</td>
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<td>18</td>
<td>IMViC Tests</td>
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<td>19</td>
<td>Selective/Differential Plates</td>
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<td>UNIT EXAMINATION 3</td>
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<td></td>
<td>How to Use Charts for Bacterial Identification</td>
<td>Handout</td>
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<td>21</td>
<td>Distribution and Streaking of Unknowns</td>
<td>5, 5</td>
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<td>22</td>
<td>Intestinal Pathogens</td>
<td>4, 8</td>
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<td>23</td>
<td>Identification of Pathogenic \textit{Staphylococcus aureus}</td>
<td>4, 9</td>
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<tr>
<td></td>
<td>Continue Work on Unknowns</td>
<td>5, 0</td>
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<tr>
<td>24</td>
<td>Pyogenic Streptococci</td>
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<td>25</td>
<td>Continue Work on Unknowns</td>
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<tr>
<td>26</td>
<td>Microbiological Water Quality Assessment</td>
<td>Handout</td>
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<td></td>
<td>Microbiological Water Quality Assessment (continued)</td>
<td>Handout</td>
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<td>Continue Work on Unknowns</td>
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<td>27</td>
<td>Yeasts and Molds</td>
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<td>Disinfectants and Antiseptics</td>
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<td></td>
<td>molds (continued)</td>
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<td></td>
<td>Antibiotics</td>
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<td>29</td>
<td>Continue Work on Unknowns</td>
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<td>30</td>
<td>Finish Work on Unknowns</td>
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<tr>
<td>31</td>
<td>Review</td>
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<td></td>
<td>Unknowns Reports Due</td>
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<tr>
<td>32</td>
<td>FINAL EXAMINATION</td>
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</tbody>
</table>

Microbiology 140 lab report outline

**INTRODUCTION:** This section begins with a brief statement of the objective or purpose of the experiment (i.e. what are the goals of the experiment) including the names of the technique and the organisms being used. Also, included in this section is some general background information. (2 POINT)

**DATA / OBSERVATIONS / SAMPLE CALCULATIONS:** Tables, graphs, and diagrams show what happened during the course of your research. The clearest representation of data is in tabular or graphical format. Label all charts, tables and graphs. Be sure to list any organisms used. A sample calculation (of each type of calculation) involving the data must be included in this section. (6 POINTS)

**DATA ANALYSIS:** This section is the most important one. It shows your ability to interpret your findings. Try to be specific as to what each part of your data shows, avoiding vague generalizations and meaningless statements. Do NOT just restate your data. Analyze what your data is showing. If there are sources of scientific error in your experiment, they should be mentioned here. (10 POINTS)

**CONCLUSION:** This section is a brief summary of your experiment. Do your results prove or disprove your hypothesis? (2 POINT)