BIOL 3702: Microbiology Laboratory Schedule

Disclaimer Notice: Serious effort and consideration were used in formulating this calendar. While viewed as an educational contract between the course instructor and student, unforeseen events may cause changes to the scheduling of lectures, examinations, etc. Every effort will be made NOT to change scheduled items. Nonetheless, the course instructor reserves the right to make any changes deemed necessary to best fulfill the course objectives. Such changes will be announced to registered students in a timely fashion using reasonable means. This disclaimer does not abrogate any student rights granted by the University.

WEEK 1
Monday, January 22

Class Activity:
• Meet your Teaching Assistant (TA)
• Orientation to the laboratory
• Review:
  ➢ Rules of Conduct and General Safety, pages xi-xii
  ➢ Summary of Universal Precautions and Laboratory Safety Procedures, pages xiii-xiv
  ➢ General Laboratory Procedures - available at the following URL:
    http://www.as.ysu.edu/~crcooper/LabRules.pdf

Individual Activity:
• Exercise #1: Bright-Field Light Microscopy and Microscopic Measurement of Organisms, pages 2-12
  ➢ Perform: Steps 1-8 of Procedure for Basic Microscopy: Proper Use of the Microscope, pages 3-5
  ➢ Laboratory Report: Complete all of page 9 and Question #3 on page 11; Short answer questions on pages 12-14 to be assigned by the TA

Wednesday, January 24

Quiz I: Laboratory Safety and Procedures

Individual Activity:
• Continue with Exercise #1
• Exercise #6: Negative Staining, pages 34-38
  ➢ Perform: Steps 1-7 of Procedure, pages 35-36
  ➢ Laboratory Report: Complete all of page 37; Short answer questions on page 38 to be assigned by the TA
WEEK 2
Monday, January 29th and Tuesday, January 30th

Individual Activity:

- **Exercise #7:** Smear Preparation and Simple Staining, pages 39-44
  - **Perform:** Steps 1-4 of Procedure – Smear Preparation, pages 40-41, and Steps 1-6 of Procedure – Simple Staining, page 41
  - **Laboratory Report:** Complete Question #1 on page 43; Short answer questions on pages 43-44 to be assigned by the TA

- **Exercise #8:** Gram Stain, pages 45-52
  - **Perform:** Steps 1-11 of Procedure for Traditional Gram-Stain Technique, pages 47-48 and Steps 1-4 for Control Procedure, page 48
  - **Laboratory Report:** Complete Questions #1 and #2 on page 51; Short answer questions on page 52 to be assigned by the TA

Wednesday, January 31st and Thursday, February 1st
Continue with Exercises 7 and 8

WEEK 3
Monday, February 5th and Tuesday, February 6th

Individual Activity:

- **Exercise #9:** Acid-Fast Staining, pages 53-58
  - **Perform:** Ziehl-Neelson Procedure only, pages 54-55
  - **Laboratory Report:** Complete Questions #1 through #3 on page 57; Short answer questions on page 58 to be assigned by the TA

- **Exercise #10:** Endospore Staining, pages 59-64
  - **Perform:** Procedure on pages 60-61
  - **Laboratory Report:** Complete Questions #1 through #3 on page 63; Short answer questions on page 64 to be assigned by the TA

Wednesday, February 7th and Thursday, February 8th
Quiz II: covers Exercises #8 through #10
Continue with Exercises 8 and 9
WEEK 4
Monday, February 12th and Tuesday, February 13th

Skills Test I: Gram Stain Unknown (download the instructions for this test at the following URL: http://www.as.ysu.edu/~crcooper/3702ST1.pdf)

Individual Activities:

● Exercise #14: Culture Transfer Instruments, Techniques, and Isolation and Maintenance of Pure Cultures, pages 85-93
  ➢ Perform: All Steps of Procedure for Culture Transfer Instruments and Techniques, pages 88-90
  ➢ Laboratory Report: Complete all of page 91; Short answer questions on pages 92-93 to be assigned by the TA

● Exercise #16: The Streak-Plate Technique and Differential Media, pages 101-106
  ➢ Perform: Steps 5-7 of Procedure on page 102 (tryptic soy agar plates will be provided for you– omit steps 1-4) and steps 5-6 of Procedure on page 104 (media will be provided for you– omit steps 1-4)
  ➢ Laboratory Report: Questions on pages 105-106 to be assigned by the TA

Wednesday, February 14th and Thursday, February 15th

Complete All Portions of Skills Test I

WEEK 5
Monday, February 19th and Tuesday, February 20th

Skills Test II: Streak Plate (download the instructions for this test at the following URL: http://www.as.ysu.edu/~crcooper/3702ST2.pdf. NOTE: Inoculate plates, and then submit to TA for incubation/scoring.

Group Activity:

● Exercise #19: Determination of Bacterial Numbers, pages 119-126
  ➢ Perform: Procedure – Standard Plate Count on page 120
  ➢ Laboratory Report: Complete Question #1 on page 123; Short answer questions on pages 125-126 to be assigned by the TA

Wednesday, February 21st and Thursday, February 22nd

Complete All Portions of Skills Test II and Exercise #19
WEEK 6

Monday, February 26th and Tuesday, February 27th

Group Activities:

- **Exercise #20**: Carbohydrates I: Fermentation and ß-Galactosidase Activity, pages 128-134
  - **Perform**: All Steps of Procedure – Durham Tube, page 131
  - **Laboratory Report**: Complete Questions #1 and #2 on page 133; Short answer questions on pages 133-134 to be assigned by the TA

- **Exercise #21**: Carbohydrates II: Triple Sugar Iron Test, pages 135-140
  - **Perform**: Procedure on page 137
  - **Laboratory Report**: Complete Question #1 on page 139; Short answer questions on pages 139-140 to be assigned by the TA

- **Exercise #24**: Proteins, Amino Acids, and Enzymes I: Hydrogen Sulfide Production and Motility, pages 149-154
  - **Perform**: Procedure on page 151
  - **Laboratory Report**: Complete Questions #1 and #2 on page 153; Short answer questions on pages 153-154 to be assigned by the TA

- **Exercise #25**: Proteins, Amino Acids, and Enzymes II: The IMViC Tests, pages 155-162
  - **Perform**: All Procedures – Durham Tube, pages 157-160
  - **Laboratory Report**: Complete Questions #1, #2, and #3 on page 161; Short answer questions on pages 161-162 to be assigned by the TA

- **Exercise #28**: Proteins, Amino Acids, and Enzymes V: Catalase Activity, pages 171-174
  - **Perform**: Step 4 of Procedure – Second Period on page 172 should be conducted with cultures to be provided for you
  - **Laboratory Report**: Complete Question #1 on page 173; Short answer questions on pages 173-174 to be assigned by the TA

Wednesday, February 28th and Thursday, March 1st

Complete All Portions of Exercises 20-21, 24-25, and 28
WEEK 7
Monday, March 5th and Tuesday, March 6th

Group Activities:

● **Exercise #30:** Proteins, Amino Acids, and Enzymes VII: Oxidase Test, pages 181-186
  ➢ **Perform:** Procedure – Second Period on page 182 (omitting KEY Oxidase Test Strip method) by placing bacteria on slides (as in Exercise 28) using cultures to be provided
  ➢ **Laboratory Report:** Complete Question #1 on page 185; Short answer questions on pages 185-186 to be assigned by the TA

● **Exercise #31:** Proteins, Amino Acids, and Enzymes VIII: Urease Activity, pages 187-192
  ➢ **Perform:** Procedure – First Period on page 188 and Procedure – Second Period (the following day) on page 189
  ➢ **Laboratory Report:** Complete Question #1 on page 191; Short answer questions on pages 191-192 to be assigned by the TA

● **Exercise #32:** Proteins, Amino Acids, and Enzymes IX: Lysine and Ornithine Decarboxylase Test, pages 193-198
  ➢ **Perform:** Procedure – First Period (Standard Method) on page 194 and Procedure - Second Period on page 196 (omitting KEY test instructions)
  ➢ **Laboratory Report:** Complete Questions #1 and #2 on page 197; Short answer questions on pages 197-198 to be assigned by the TA

● **Exercise #33:** Proteins, Amino Acids, and Enzymes X: Phenylalanine Deamination, pages 199-204
  ➢ **Perform:** Procedure on page 200 (omit Step 4 – First Period)
  ➢ **Laboratory Report:** Complete Question #1 on page 203; Short answer questions on pages 203-204 to be assigned by the TA
  ➢ **Perform:** Procedure on page 206
  ➢ **Laboratory Report:** Complete Question #1 on page 209; Short answer questions on pages 209-210 to be assigned by the TA

● **Exercise #34:** Proteins, Amino Acids, and Enzymes XI: Nitrate Reduction, pages 205-210
  ➢ **Perform:** Procedure on page 206
  ➢ **Laboratory Report:** Complete Question #1 on page 209; Short answer questions on pages 209-210 to be assigned by the TA
**Wednesday, March 7th and Thursday, March 8th**

Complete All Portions of Exercises 30-34

**WEEK 8**

Spring Break – Laboratory Closed

**WEEK 9**

**Monday, March 19th and Tuesday, March 20th**

Skills Test III: Bacterial Unknowns (download the instructions for this test at the following URL: http://www.as.ysu.edu/~crcooper/3702ST3.pdf)

**Wednesday, March 21st and Thursday, March 22nd**

Quiz III: Biochemical Diagnostic Tests

Continue with Skills Test III

**WEEK 10**

**Monday, March 26th and Tuesday, March 27th**

Continue with Skills Test III

**Wednesday, March 28th and Thursday, March 29th**

Continue with Skills Test III

**WEEK 11**

**Monday, April 2nd and Tuesday, April 3rd**

Complete Skills Test III and Submit Report by End of Laboratory Session

Group Activities:

- **Exercise #39: Temperature, pages 242-246**
  - Perform: Procedure on pages 243-244
  - Laboratory Report: Complete Questions #1, #2 and #3 on page 245; Short answer questions on page 246 to be assigned by the TA

- **Exercise #40: pH, pages 247-250**
  - Perform: Procedure on page 248
  - Laboratory Report: Complete Questions #1 through #7 on page 249; Short answer questions on page 250 to be assigned by the TA

**Wednesday, April 4th and Thursday, April 5th**

Complete All Portions of Exercises 39 and 40
**WEEK 12**

*Monday, April 9th and Tuesday, April 10th*

- **Exercise #41: Osmotic Pressure, pages 251-254**
  - **Perform:** Procedure on page 252
  - **Laboratory Report:** Complete Questions #1 through #8 on page 253; Short answer questions on page 254 to be assigned by the TA

- **Exercise #61: Bacterial Mutation, pages 389-392**
  - **Perform:** Procedure on page 390
  - **Laboratory Report:** Complete Questions #1 through #3 on page 391; Short answer questions on page 392 to be assigned by the TA

*Wednesday, April 11th and Thursday, April 12th*

Complete All Portions of Exercises 41 and 61

**WEEK 13**

*Monday, April 16th and Tuesday, April 17th*

- **Exercise #50: Bacterial Count of a Food Product, pages 315-318**
  - **Perform:** Procedure on pages 315-316
  - **Laboratory Report:** Complete Questions #1 through #3 on page 317; Short answer questions on page 318 to be assigned by the TA

*Wednesday, April 18th and Thursday, April 19th*

Complete All Portions of Exercises 41 and 61

**WEEK 14**

*Monday, April 23rd and Tuesday, April 24th*

Complete All Laboratory Work, Clean Out Incubators, Clean Up Work Area

*Wednesday, April 25th and Thursday, April 26th*

Quiz IV: Covers Exercises 9-41, 50, and 61

**WEEK 15**

*Monday, April 30th and Tuesday, May 1st*

Laboratory Closed

*Wednesday, May 2nd and Thursday, May 3rd*

Laboratory Closed