| Week /Lab | Date | Experiment | Reminders |
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| Lab 1 | Tues/ Wed 3/30, 3/31 | ○ Registration, introductory remarks, safety lecture, etc.<br>**Sterile technique.**<br>○ Expt 1: Microbes in the environment<br>○ Expt 2: *E.coli* and toilet paper experiment<br>○ Expt 3: Aseptic technique, streak and spread plates of a mixed culture for isolated colonies.<br>**Use of pipettors:** Demo | **Reminder: Discuss food samples for contamination** |
| Lab 2 | Thurs/ Fri 4/1, 4/2 | **Sterile technique.**<br>○ Expt 1: Microorganisms in the environment: Observe results<br>○ Expt 2: *E.coli* and toilet paper experiment: Observe results<br>○ Expt 3: Streak and spread plates: Observe results.<br>**Microscopy:**<br>○ Expt 4A: Learning to focus the light microscope<br>○ Expt 4B: Calibrating your microscope<br>○ Expt 4C: Observing live microorganisms: The wet-mount and phase-contrast microscopy<br>• Bright-field vs. phase–contrast microscopy<br>• Prokaryotes vs. Eukaryotes<br>**Plant Pathogens:**<br>○ Expt 34: Set up *Agrobacterium*-kalanchoe infections<br>**Winogradsky column**<br>○ Expt 5: Understanding the set up | **Reminder: Set up groups for for food contamination** |

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| Lab 3 | Tues/ Wed 4/6, 4/7 | **Understanding dilutions:**<br>o Expt 6: Understanding dilutions- theory<br>**Measuring Microbial Growth: Yeast and SDA**<br>o Expt 7A*:* Using a spectrophotometer<br>o Expt 7B: Use of a hemocytometer<br>o Expt 7C: Counting viable cells using plating<br>**Microscopy: Staining**<br>o Expt 8A: Smear preparation and simple staining<br>o Expt 8B: Gram stain: standard organisms only<br>**Detection of bacterial food contaminants**<br>Expt 9: Take food samples home | **REMINDER: Take food samples home today and bring back on Thursday/Friday** |
| Lab 4 | Thurs/ Fri 4/8, 4/9 | **Microscopy: Staining**<br>o Expt 8: Repeat staining and microscopy as required<br>**Detection of bacterial food contaminants**<br>o Expt 9: Serial dilution and plating<br>**Unknown Organism**<br>o Expt 10A: Receive unknown: wet mount and streak plate for single colonies. First Gram Stain of unknown. | **REMINDER: Bring contaminated food samples for experiment today** |
| Lab 5<br><br>(continued) | Tues/ Wed 4/13, 4/14 | **Unknown Organism:**<br>o Expt 10A: Examine streak plate<br>o Expt 10B: Inoculate broths, slants and plates with unknown<br>o Repeat Gram stain of unknown organism<br>o Repeat microscopic examination of unknown: wet mount for shape, size, and motility<br>o Expt 11: Oxygen requirement – inoculate thioglycolate tube | |

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| | | ○ Expt 14: Nutrient Sporulation Medium (NSM) – streak slant<br>**Isolation of bacterial food contaminants:**<br>○ Expt 9: Complete colony counts<br>**Library Workshop on research and writing reports** | |
| Lab 6 | Thurs/ Fri 4/15, 4/16 | **Unknown Organism:**<br>○ Expt 11 Oxygen requirement – complete<br>○ Expt 12: Streak unknown on MacConkey plate<br>○ Bacterial motility<br>• Expt 13A: Preparing wet mounts<br>• Expt 13B: Observing motility on plates, deeps - inoculate<br>○ Expt 14: Bacterial endospores<br>• NSM: Wet mount (and simple stain)<br>○ Expt 15: Nitrate reduction – inoculate<br>○ Expt 16: $H_2S$ production – inoculate | |
| Lab 7 | Tues/ Wed 4/20, 4/21 | **Unknown organism:**<br>○ Expt 12: Examine MacConkey<br>○ Expt 13: Motility – complete<br>○ Expt 15: Nitrate reduction - complete<br>○ Expt 16: $H_2S$ production - Check, reincubate as necessary<br>○ Expt 17: Acid and gas production from sugar fermentation – inoculate fermentation tubes<br>○ Expt 18: Methyl-Red and Voges-Proskauer – inoculate<br>○ Expt 19A&B, Expt 13C: Streak plate with unknown | |

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| Lab 8 | Thurs/ Fri 4/22, 4/23 | **Unknown organism:**<br>o Expt 13C: Flagellar stain<br>o Expt 17: Acid and gas from sugar fermentation - complete<br>o Expt 18: Methyl-Red and Voges Proskauer – complete<br>o Expt 19A: Cytochrome C test – complete<br>o Expt 19B: Catalase test – complete<br>o Hydrolysis and use of large extracellular materials – inoculate<br>• Expt 20A: Polysaccharides: Starch plates<br>• Expt 20B&C: Proteins: Skim milk plates and gelatin deeps<br>• Expt 20D: Lipids: Rhodamine plates<br>**Streak Plate Test** | **Reminder: Take home saliva collection tube today** |
| Lab 9 | Tues/ Wed 4/27, 4/28 | **Unknown organism:**<br>o Expt 20: Hydrolysis and use of large extracellular materials - complete<br>o Expt 21: Indole production from tryptophan, catabolite repression – inoculate<br>o Expt 22: Urease test – inoculate<br>o Expt 23: Differential utilization of citrate by enterics - inoculate<br>**Yogurt Production**<br>o Expt 24: Inoculate milk<br>**Dental Flora**<br>o Expt 25: Inoculate Snyder agar | **Reminder: Bring saliva sample today.**<br><br>**Reminder: Bring water sample on Thurs/Fri– 1 sample per student, ~75 ml in any clean container** |

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| Lab 10 | Thurs/ Fri 4/29, 4/30 | **Unknown organism:**<br>○ Expt 21: Indole production from tryptophan, catabolite repression - complete<br>○ Expt 22: Urease test - complete<br>○ Expt 23: Differential utilization of citrate by enterics - complete<br>○ Unknown Repeats<br>**Yogurt Production**<br>○ Expt 24: Complete<br>**Dental Flora**<br>○ Expt 25: Complete<br>**Coliforms in water**<br>Expt 26: Colilert: incubation of water sample<br>**Transposon mutagenesis**<br>○ Expt 27A: Set up conjugation | **Reminder: Bring water sample today.** |
| Lab 11 | Tues/ Wed 5/4, 5/5 | **Unknown organism**<br>○ Complete repeats<br>**Coliforms in water**<br>Expt 26: Examine Colilert and streak Levine EMB<br>**Transposon mutagenesis**<br>○ Expt 27A: Set up selection<br>**Evaluation of Antiseptics and Disinfectants**<br>○ Expt 28: Spread plates with standards and test efficiency of antiseptics and disinfectants | |
| Lab 12<br>(continued) | Thurs/ Fri 5/6, 5/7 | **Coliforms in water**<br>Expt 26: Set up Enterotube<br>**Transposon mutagenesis**<br>○ Expt 27B: Grid to select for amino acid auxotrophs | **Computer demo** |

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| | | **Evaluation of Antiseptics and Disinfectants**<br>o Expt 28: Complete<br>**Bacterial viruses**<br>o Expt 29: Titering phage | |
| Lab 13 | Tues/ Wed 5/11, 5/12 | **Coliforms in water**<br>o Expt 26: Evaluate Enterotube and post results<br>**Transposon mutagenesis**<br>o Expt 27C: Identification of Site of Transposon Mutagenesis<br>o Analyze mutant sequence and discuss analysis<br>o Restreak mutants<br>**Bacterial viruses**<br>o Expt 29: Complete<br>**Evaluation of antibiotics by the Kirby Bauer method**<br>o Expt 30: Spread plates with standards and test efficiency of antibiotics<br>**Nitrogen Fixation - Anabaena**<br>o Expt 33A: Inoculate BG11 and BG11-0 | **Computer lab** |
| Lab 14 | Thurs/ Fri 5/13, 5/14 | **Transposon mutagenesis**<br>o Expt 27C: Set up broth cultures of mutant for glycerol stock<br>o Expt 27D: Set up complementation of auxotrophs with amino acid<br>**Evaluation of antibiotics by the Kirby Bauer method**<br>o Expt 30: Measure ZOI<br>**Soil Day 1:**<br>o Expt 31A: Metagenomics: Clone PCR product into pGEM-T and transform E.coli | |

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| Lab 15 | Tues/ Wed 5/18, 5/19 | **Transposon mutagenesis**<br>Expt 27E: Observe results of complementation<br>**Soil Day 1:**<br>o Expt 31A: Metagenomics: Restreak colonies for sequencing<br>o Expt 31B: Serial dilution, plating on TSA, (SDA), GAA, and MacConkey<br>o Expt 31C: Plate on differential media<br>o Expt 31E: Begin testing for presence of spores (exposure to high heat, serial dilution, and plating) | |
| Lab 16 | Thurs/ Fri 5/20, 5/21 | **Soil Day 2:**<br>o Expt 31A: Metagenomics: Receive and upload sequences<br>o Expt 31E: Count colonies<br>**Growth Curve Experiment**<br>o Expt 32: Growth and graphing of *Vibrio natriegens* | |
| Lab 17 | Tues/ Wed 5/25, 5/26 | **Soil Day 3:**<br>o Expt 31A: Metagenomics: Analyze sequence<br>o Expt 31B: Enumeration: colony counts<br>o Expt 31C: Examine and enumerate colonies on differential media<br>o Expt 31D: Identification of antibiotic producers: Grid plates<br>**Nitrogen Fixation**<br>o Expt 33A: Anabaena – examine for heterocysts<br>o Expt 33B: Observe *Rhizobium*-legume interaction. | |

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| Lab 18 | Thurs/ Fri 5/27, 5/28 | **Soil Day 4:**<br>- ~~o~~ Expt 31A: Metagenomics: Discussion of metagenomics sequence.<br>- o Expt 31B: Wet mounts - complete<br>- o Expt 31D: Identification of antibiotic producers: check for ZOI<br>**Nitrogen Fixation**<br>- o Expt 33A: *Anabaena*: check for heterocysts - complete<br>**Plant Pathogen**<br>- o Expt 34: Observe *Agrobacterium*-kalanchoe interaction<br>**Winogradsky column**<br>- o Expt 5: Observation and sampling<br>**Lab Clean-up and Equipment Check** | |
| Lab 19 | Tues/ Wed 6/1, 6/2 | **Potluck, Discussions/Review Session** | |
| Lab 20 | Thurs/ Fri 6/3, 6/4 | The last midterm will be held during normal lab hours. No lecture today | |