Lab	Date	Experiment	Reports, Midterms, Reminders
Lab 1	Tues/Wed Jan 5-6	○ Registration, introductory remarks, safety lecture, etc. **Sterile technique.** ○ Expt 1: Microbes in the environment ○ Expt 2: *E.coli* and toilet paper experiment ○ Expt 3: Aseptic technique, streak and spread plates **Use of pipettors:** Demo	**Reminder: Discuss food samples for contamination**
Lab 2	Thurs/Fri Jan 7-8	**Sterile technique.** ○ Expt 1: Microbes in the environment: Observe results ○ Expt 2: *E.coli* and toilet paper experiment: Observe results ○ Expt 3: Streak and spread plates: Observe results. **Microscopy:** ○ Expt 4A: Learning to focus the light microscope ○ Expt 4B: Calibrating your microscope ○ Expt 4C: Observing live microorganisms: The wet-mount and phase-contrast microscopy • Bright-field vs. phase–contrast microscopy • Prokaryotes vs. Eukaryotes **Plant Pathogens:** ○ Expt 33: Set up *Agrobacterium*-kalanchoe infections **Winogradsky column** ○ Expt 5: Understanding the set up	

Lab 3	Tues/Wed Jan 12-13	**Understanding dilutions:** ○ Expt 6: Understanding dilutions- theory **Measuring microbial growth: Yeast and SDA** ○ Expt 7A*:* Using a spectrophotometer ○ Expt 7B: Use of a hemocytometer ○ Expt 7C: Counting viable cells using plating **Microscopy: Staining** ○ Expt 8A: Smear preparation and simple staining ○ Expt 8B: Gram stain: standard organisms only	**REMINDER: Take food samples home today and bring back on Thurs/Friday**
Lab 4	Thurs/Fri Jan 14-15	**Microscopy: Staining** ○ Expt 8: Repeat staining and microscopy as required **Detection of bacterial food contaminants** ○ Expt 9: Serial dilution and plating **Unknown Organism** ○ Expt 10A: Receive unknown: wet mount and streak plate	**REMINDER: Bring contaminated food samples for experiment today**
Lab 5	Tues/Wed Jan 19-20	**Unknown Organism:** ○ Expt 10A: Examine streak plate ○ Expt 10B: Inoculate broths, slants and plates with unknown ○ Gram stain of unknown organism ○ First microscopic examination of unknown: wet mount for shape, size, and motility ○ Expt 13: Nutrient Sporulation Medium (NSM) – streak slant **Isolation of bacterial food contaminants:** ○ Expt 9: Complete colony counts **TA-run workshop on writing a report**	

Lab 6	Thurs/Fri Jan 21-22	**Unknown Organism:** ○ Expt 11: Streak unknown on MacConkey plate ○ Bacterial motility • Expt 12A: Preparing wet mounts • Expt 12B: Observing motility on plates, deeps - inoculate ○ Expt 13: Bacterial endospores • NSM: Wet mount (and simple stain) ○ Expt 14: Nitrate reduction – inoculate ○ Expt 15: H_2S production – inoculate	
Lab 7	Tues/Wed Jan 26-27	**Unknown organism:** ○ Expt 11: Examine MacConkey ○ Expt 12: Motility – complete ○ Expt 14: Nitrate reduction - complete ○ Expt 15: H_2S production - Check, reincubate as necessary ○ Expt 16: Oxygen requirements – inoculate thioglycolate tube ○ Expt 17: Acid and gas production from sugar fermentation – inoculate fermentation tubes ○ Expt 18: Methyl-Red and Voges-Proskauer – inoculate ○ Expt 19A&B: Streak plate with unknown	**Report 1 due: Bacterial contamination of food**
Lab 8 (cont.)	Thurs/Fri Jan 28-29	**Unknown organism:** ○ Expt 16: Oxygen requirements –complete ○ Expt 17: Acid and gas from sugar fermentation - complete ○ Expt 18: Methyl-Red and Voges Proskauer – complete	**Streak plate assessment**

		○ Expt 19A: Cytochrome C test – complete ○ Expt 19B: Catalase test – complete ○ Hydrolysis and use of large extracellular materials – inoculate • Expt 20A: Polysaccharides: Starch plates • Expt 20B&C: Proteins: Skim milk plates and gelatin deeps • Expt 20D: Lipids: Rhodamine plates	
Lab 9	Tues/Wed Feb 2-3	**Unknown organism:** ○ Expt 20: Hydrolysis and use of large extracellular materials - complete ○ Expt 21: Indole production from tryptophan, catabolite repression – inoculate ○ Expt 22: Urease test – inoculate ○ Expt 23: Differential utilization of citrate by enterics - inoculate **Transposon mutagenesis** ○ Expt 24A: Set up conjugation	**Reminder: Bring water sample on Thurs/Fri – 1 sample per student, ~75 ml in any clean container**
Lab 10	Thurs/Fri Feb 4-5	**Unknown organism:** ○ Expt 21: Indole production from tryptophan, catabolite repression - complete ○ Expt 22: Urease test - complete ○ Expt 23: Differential utilization of citrate by enterics - complete ○ Unknown Repeats **Coliforms in water** ○ Expt 25: Colilert, incubation of water sample **Transposon mutagenesis** ○ Expt 24A: Set up selection	**Reminder: Bring water sample today.** **Reminder: TAs bring soil sample for next lab**

Lab 11	Tues/Wed Feb 9-10	**Unknown organism** ○ Complete repeats **Coliforms in water** ○ Expt 25: Examine Colilert and streak Levine EMB **Transposon mutagenesis** ○ Expt 24B: Grid to select for amino acid auxotrophs **Soil Day 1:** ○ Expt 26A : Serial dilution, plating on TSA, SDA, GAA, and MacConkey – aerobic and anaerobic ○ Expt 26C: Plate on differential media ○ Expt 26E: Begin testing for presence of spores (exposure to high heat, serial dilution, and plating)	**Reminder: TAs bring soil sample today**
Lab 12	Thurs/Fri Feb 11-12	**Coliforms in water** ○ Expt 25: Set up Enterotube **Transposon mutagenesis** ○ Expt 24B: restreak to confirm mutants ○ Final selection of mutants, streak for PCR **Soil Day 2:** ○ Expt 26B: Soil metagenomics: Clone PCR product into pGEM-T and transform *E. coli* ○ Expt 26E: Count colonies	**Syllogistic tree for "Unknown" report due**
Non lab day		**Transposon mutagenesis** ○ Expt 24C: **TAs** set up PCR of transposon mutants	

Lab 13	Tues/Wed Feb 16-17	**Coliforms in water** o Expt 25: Evaluate Enterotube **Transposon mutagenesis** o Expt 24C: PCR product purification o Expt 24D: Titer phage stock **Soil Day 3:** o Expt 26A: Enumeration: colony counts ; wet mounts o Expt 26B: Metagenomics: Restreak colonies for sequencing o Expt 26C: Examine and enumerate colonies on differential media o Expt 26D: Identification of antibiotic producers: Grid plates **Nitrogen Fixation - Anabaena** o Expt 27A: Inoculate BG11 and BG11-0	**Midterm 1: Topics as posted in class** **Computer lab**
Non lab day		**TAs send colonies (26B) for sequencing; Run gel and send PCR (24C) for sequencing**	
Lab 14	Thurs/Fri Feb 18-19	**Transposon mutagenesis** o Expt 24C: Analyze mutant sequence o Expt 24D: Transduce mutant with phage **Soil Day 4:** o Expt 26A: Wet mounts o Expt 26B: Metagenomics: Analyze sequence o Expt 26D: Identification of antibiotic producers: check for ZOI **Evaluation of antiseptics and disinfectants** o Expt 28: Spread plates with standards and test efficiency of antiseptics and disinfectants	**Computer lab**

Lab 15	Tues/Wed Feb 23-24	**Transposon mutagenesis** o Expt 24D: Restreak wild-type, mutant, and transductant o Expt 24E: Set up complementation of auxotrophs with amino acids **Soil Day 5:** o Expt 26D: Identification of antibiotic producers: recover media for expt 29 **Evaluation of antiseptics and disinfectants** o Expt 28: complete **Evaluation of antibiotics by the Kirby Bauer method** o Expt 29: Spread plates with standards and test efficiency of antibiotics o *Test putative antibiotic produced by antibiotic producer*	**Report 2 due** **Computer lab** **Sterile technique assessment**
Lab 16	Thurs/Fri Feb 25-26	**Transposon mutagenesis** o Expt 24D: Observe restreak plates o Expt 24E: Observe results of complementation **Soil Day 6:** o Expt 26B: Discussion of metagenomics results **Evaluation of antibiotics** o Expt 29: measure ZOI, identify any resistant colonies, set up broth cultures of resistant colonies	**Reminder: take home saliva collection tubes**

Lab 17	Tues/Wed Mar 2-3	**Nitrogen Fixation** o Expt 27A: Anabaena – examine for heterocysts o Expt 27B: Observe *Rhizobium*-bean interaction. o Culture Rhizobium from roots **Evaluation of antibiotics** o Expt 29: test resistance of resistant colonies **Yogurt Production** o Expt 30: inoculate milk **Growth curve experiment** o Expt 31: Growth and graphing of *Vibrio natriegens* **Dental Flora** o Expt 32: Inoculate Snyder agar	**Reminder: bring saliva samples today**
Lab 18	Thurs/Fri Mar 4-5	**Winogradsky column** o Expt 5: Observation and sampling **Evaluation of antibiotics** o Expt 29: observe results of resistance verification experiment **Nitrogen Fixation** o Expt 27A: *Anabaena*: check for heterocysts o Expt 27B: *Rhizobium*: Observe TSA plates **Yogurt Production** o Expt 30: complete **Dental Flora** o Expt 32: complete **Plant Pathogen** o Expt 33: Observe *Agrobacterium*-kalanchoe interaction	**Report 3 due** **Lab clean-up**

Lab 19	Tues/Wed Mar 9-10	Discussions/Presentations Potluck	
Lab 20	Thurs/Fri Mar 11-12	Midterm 3 will be held during normal lab hours. No lecture today	**Midterm 2: Topics as posted in class.**