**Biology 422L Laboratory Experiments**

**Fall, 2019**

**Laboratory objective –**To learn some of the major techniques and procedures used in working with bacteria. Although the results you will obtain in these experiments are standard and easily verifiable in published papers and texts, the experiments are designed to provide you with experience in a variety of the most commonly used techniques of bacteriology. In a working microbiology laboratory if you wished to use a new technique you would check whether you were doing the technique correctly by using it in a standard well-documented experiment as you are doing here.

**Schedule for 422L**

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| **Date** | **Experiment** | **Hand In** |
| Aug. 27,28 & Sept. 3,4 (S) | \*1) Sterile Technique  Viable cell count  Plate streaking | 1) Plates |
| Sept. 10,11 (L) | \*2) Growth Curve  Gram stain  Separating individual colonies | 2) Report (graph & 2 pages)  2)Hand in plates |
| Sept. 17,18 (L) | \*3) β-galactosidase Induction | 3) Report (graph, table & 2 pages) |
| Sept. 24,25  (S) | \*4) Isolation of Bacteria from Nature | **---** |
| Oct. 1, 2 | \*4) Isolation of bacteria from nature  \*5) Transposon mutagenesis Part 1 | 4) Report (2-4 pages) & Chart.  Due after experiment completed |
| Oct. 8, 9 | \*5) Transposon mutagenesis Part 2 |  |
| Oct. 15,16 (L) | \*5) Transposon mutagenesis Part 2 | 5) Report (2 pages) |
| Oct. 22,23 | 6) Biochemical Pathways | 6) Report (2 pages) |
| Oct. 29,30 (S) | Clean up lab | All lab reports must be in by Nov. 1 |
| Nov. 19,20 | Lab final |  |

(S) Short lab You should be done by 3 PM.

(L) Long lab this lab may last after 4 PM: if this is a problem for you, make arrangements with your TA before the lab.

Please note that for most labs you will need to come in the next day between 9AM and noon or 2 and 5PM to continue your experiment. The lab will be open 9 to 5 weekdays. You should avoid coming in during the first hour of any other lab section since this may disrupt that section. **See instructions below.**

**Information for work to be done outside your scheduled lab meeting**

**Lab 1:**  This lab will require you to come in and count your plates and calculate your data. You must complete this lab correctly in order to do the remainder of the course as these techniques are required in all the subsequent labs. So that you can do this, the lab will be open weekdays 9-5 with materials available. If you need help come during TA office hours or see Dr. Matthysse immediately after class. This will require variable amounts of time to complete depending on your previous experience and may take up to 6 separate attempts on different days.

**Lab 2:** This lab will require you to come in the next day and count plates and calculate your data**.** You will also need to come in several times to complete streaking pure cultures from the mixture you were given.

**Lab 3**: This lab will not require you to come in on succeeding days.

**Lab 4:** Isolation of bacteria from nature is an unpredictable lab as the bacteria present depend on such things as the weather and any activity such as construction or fertilization near the site from which the soil samples are taken. This lab may take as long as 5 weeks to complete and require you to monitor your cultures and come in as necessary to transfer and characterize them during that time.

**Lab 5**: Transposon mutagenesis will require you to come in the next day or the day after and check your plates. When your plates have grown up you will need to pick colonies. The third week you will need to score the colonies you picked during class.

**Lab 6**: Biochemical pathways requires that you come in and score your plates the next day.