

CHEMISTRY FRONTIERS (CHE 3500)

WINTER 2022

Instructor:: Dr. Balasingam Murugaverl (VERL)

General:

The class is scheduled from 1:00 to 4:50 p.m. on Mondays and Tuesdays at SGM 109. However, since this is a research course you will work at your own phase (the times are flexible) and the actual work will be carried out at various laboratories in the Mudd building and Olin hall. There will be schedule of lectures on special topics. Be prompt to all lectures.

Due to the current situation, initial lectures will be online on Zoom. Refer to Canvas for Zoom lecture schedules.

Course Overview:

The goal of this course is to provide chemistry and biochemistry majors with the essential skills for scientific research, and to prepare them for what awaits them in the real world of science. All the theories and concepts that the students learn in the lectures originated from attempts to explain experimental observations. This problem solving aspect of science demands a higher level of thinking and the purpose of this course is to stimulate that. The course is designed to provide the students with hands on approach to all aspects of the Scientific Method, without dwelling too much on theory. Students will work in teams on a goal-oriented project that are interdisciplinary, crossing boundaries across fields and across other disciplines. The research projects are quite broad, current, and carefully selected to provide with a unique opportunity to learn what it will be like to do real research. The student team is responsible for gathering information, planning, designing, and executing experiments to bring the project to a reasonable conclusion. Finally, the work is presented in a written and verbal format. The lecture portion of the course will include literature searching, experimental design and planning, technical writing, and oral presentation.

Course Requirements:

Attendance - since this is a research oriented course, attendance is critical and a significant portion of the grade will be based on attendance. Students are expected to be **prompt to all scheduled lectures**.

Reports - the lab reports (including the final report) will be written in an ACS journal article format (which will be selected on the first day of class). The reports are due by the dates scheduled. Reports will be evaluated on its adherence to style, presentation of background information, and knowledge of the subject material. **Late reports will not be accepted, and will cost one grade point per delinquent report.**

Oral Presentation - on the final week of the quarter, each student will give a 15 minute oral presentation discussing the results of a segment of study done by his or her team. Individuals will be evaluated on the content of their presentation, comprehension of the research topic, and presentation skills.

Grading:

Attendance	250 points
Reports	500 points
Oral	250 points

Tentative Lecture Schedule

Week of Jan. 3	<u>Introduction to the course</u> - project goals and course expectations - (1/3/22) <u>Introduction to Chromatographic Techniques</u> – (1/5/22)
Week of Jan 10	<u>Introduction to Mass Spectrometric Techniques</u> - (1/10 and 12/22)
Week of Jan. 17	<u>Introduction to NMR Techniques</u> - (1/17 and 19/22)
Week of Jan 24	<u>Report Writing and Writing Skills</u> - (1/24/22) <u>Introduction to Fluorescence Techniques</u> - Dr. Todd Wells (1/26/22)
	<u>FIRST REPORT due on February 1 by 5:00 pm.</u>
Week of Jan. 31	<u>Introduction to Electrophoretic Techniques</u> - (1/31 and 2/2 /22)
Week of Feb.7	
Week of Feb.14	<u>SECOND REPORT due by February 22 by 5:00 pm.</u>
Week of Feb. 21	
Week of Feb. 28	<u>Oral Presentation Skills</u> - (2/28/22)
Week of March 7	Student Oral Presentation: (7 th and 9 th of March) <i>15 minutes per student.</i>
	Panel:
	<u>FINAL REPORT due by March 15, 2022 by 4:00 pm</u>

Important:

Students are responsible for:

1. Keeping their work area clean and safe.
2. Proper storage of chemicals (i.e. labeling, container etc).
3. Proper handling of waste (i.e. labeling, container etc).
4. Return and re-shelving of **all items** used in the project, clean and in working order.

Remember! **Failure** to respect the above requests may be **very costly to your grade.**