Syllabus-Spring 2018
CHEM 1106  Special Research Driven Course Section

Coordinator: Dr. Chuan Xiao  
Instructor: Dr. Supriyo Ray  
Office: TBA  
Office Hours: 12pm-1pm (Tue;Thu)  
Email: cxiao@utep.edu  
Email: sray4@utep.edu

Time: W-F: 9:30 am-12:20 pm (after hours work expected)

Required Materials:

ABSOLUTELY REQUIRED NO EXCEPTIONS:

- Goggles (Anzi87.1 ONLY) and Lab Coat
- Lab Manual: Laboratory Guide by BLUEDOOR
  : Photocopies or hand written notes will not be accepted.
  ALL WORK MUST BE IN PEN ONLY. WORK DONE IN PENCIL WILL NOT BE
  ACCEPTED OR GRADED

Grading:
Weekly Reports/Quiz: 20%  
Participation: 50%  
Final Report + Presentation: 30%

Suggested materials:
Lab Coat, Scientific calculator, and Sharpie

Safety guidelines:
You will be exposed to hazardous chemicals. Personal Protective Equipment, (PPE) is
necessary to protect your body. You will not be admitted in the lab if any of the following
safety guidelines are not met. If you violate safety guidelines you will be asked to leave
the lab and a grade of ZERO for the day’s lab work will be issued.

1. Shoes that cover the entire foot are required at all times.
2. Goggles or appropriate safety glasses are required at all times
3. Long sleeves and long pants are mandatory.
4. No musical devices may be used in the chemistry labs at any time
5. Use of the cell phones is NOT permitted and must be on silence and placed
  in YOUR BAG before you enter the lab.

Objectives:
This course is intended to introduce sophomores to basic General Chemistry and
Biochemistry concepts through authentic research on genes and proteins associated
with the human circadian rhythm. The skills, concepts and techniques will not only help
students apply those basic principles learned in Gen Chem I &II, but will also allow
students to actively participate in cutting edge research and learn to conduct science
the way experts do. The lab modules will not necessarily run in synchronicity with what
is being covered in CHEM 1306 (the lecture portion of Gen Chem II). Some of the
material will be presented in the context of the research topic, thus emphasizing the principles of chemistry in real world applications.

**Reports:**
Students individually have to work on their own project, write a report explaining one of the critical circadian processes and explain the experimental processes. They are expected to explain their project providing logical reasons derived from published literature. The report will be due on the last lab period.

**Lab Attendance:** Weekly target needs to be achieved period. Students will meet individually or as a group to discuss their results, progress and doubts once a week. Future directions for the upcoming week will be determined during that meeting.

**Cleaning Up after experiment:**
There are no bonus points for cleaning but, (2 points) will be deducted from each member of the group even if one of the members do not clean up after themselves.

**Participation:**
Students are expected to attend lab period and come prepared to participate in research. Students are expected to participate after class hours in research related or unrelated to their assigned projects. The purpose is to understand and rationalize the basic principles associated with protein expression and purification. Students need to inform by mail if they are going to miss a class even for a day. If a student misses two consecutive classes without informing then the instructors reserve the right to drop the student from the course automatically. If a student is found uncooperative with his/her group and does not show any interest in participating in the experiments will be served a warning and if the problem persists then the instructors reserve the right to drop the student from the course.

**Final Report/Presentation:**
Submit final report. The reports will be judged based on their overall originality and the research done to develop the project. The students are also expected to give a final presentation about their project. For rubric for presentation, please see appendix. This is the rubric that will be used to score presentations. The instructors score sheet will add up to a total of 100 points. The student’s evaluations will add up to a total of 100 points. The average of the students’ evaluations will be added to the instructors score to add up to a total of 200 points.

The Final Report is worth 30% of the written and oral presentation. Breakdown percentages will be:

200 total points:  
50% Written Part (Indiviual)  
50% Oral Presentation Part (Individual)
Safety and Cleaning Issues:
It is your responsibility to maintain your bench space clean, put chemicals away, wash your
glassware, and collaborate with your team members. NOT doing so will result in points being
deducted from your grade.

Student Conduct:

Class Environment
Cell phones must be turned off. Use of cells phones will result in dismissal of class for that day.
Each student is responsible for notice of and compliance with the provisions of the Regents
Rules and Regulations, which are available for inspection electronically at
http://www.utsystem.edu/bor/rules/homepage.htm. Use of laptops and tablets is allowed only
when specifically requested by the instructor. No liquids or food are allowed in the classroom.

Academic Dishonesty
It is the official policy of the University that all suspected cases or acts of alleged scholastic
dishonesty must be referred to the Dean of Students for investigation and appropriate
disposition. It is contrary to University policy for a faculty member to assign a disciplinary grade
such as an "F" or zero to an assignment, test, examination, or other course work as a sanction
for admitted or suspected scholastic dishonesty in lieu of normally charging the student through
the Dean of Students. Similarly, students are prohibited from proposing and/or entering into an
arrangement with a faculty member to receive a grade of "F" or any reduced grade in lieu of
being charged with scholastic dishonesty. Any student who commits an act of scholastic
dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating,
plagiarism, collusion, and the submission for credit of any work or materials that are attributable
in whole or in part to another person, taking an examination for another person, any act
designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism
"Plagiarism" means the appropriation of another person's ideas, processes, results, or words
without giving appropriate credit. This includes intentionally, knowingly or carelessly, presenting
the work of another as one's own; failing to credit sources used in a work product; attempting to
receive credit for work performed by another; failing to cite the World Wide Web, databases and
other electronic resources. Written work will be checked for plagiarism.

Students with Disabilities Policy
If you have or suspect a disability and need an accommodation you should contact Center for
Accommodations and Support (CASS) at 747-5148 or at dss@utep.edu or go to Room 106
Union East Building.

Students with Pregnancies:
If you are pregnant or you become pregnant, it is recommended that you drop the course. If you
chose not to drop, then lab coat and long sleeves, long pants and gloves, for every lab are
mandatory.
Learning Objectives:

1) Refresher on lab safety rules, research ethics and maintaining lab records
2) Refresher on cleaning, weighing samples, pipetting and sterilization techniques (autoclaving)
3) Proficiency in determining bacterial concentration through spectroscopy
4) Understanding of the concept of growth curve and protein expression in bacteria
5) Understanding of circadian rhythm
6) Proficiency in central dogma, amino acids, protein chemistry & circadian rhythm
7) Concept of acid, base, buffers and pH
8) Conduct stoichiometric calculations for making stock solutions, making bacterial growth media and buffers
9) Proficiency in Beer-Lambert’s law and UV-visible spectroscopy
10) Determining protein concentration through spectroscopy and standard curve
11) Demonstrate proficiency in handling different types of centrifugation
12) Demonstrate proficiency in running controls for an experiment
13) Understanding of Fast Protein Liquid Chromatography (FPLC)
14) Demonstrate proficiency in protein purification using affinity chromatography
15) Conduct ion exchange/heparin chromatography & Size exclusion chromatography (if required)
16) Demonstrate proficiency in polyacrylamide gel electrophoresis, staining and destaining
17) Demonstrate proficiency in scientific writing and research data presentation