SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 24.0101

SEMESTER: Departmental Syllabus

COURSE TITLE: Biochemistry Laboratory

COURSE NUMBER: CHEM-0251

CREDIT HOURS: 2

INSTRUCTOR: DEPARTMENTAL SYLLABUS

OFFICE LOCATION: DEPARTMENTAL SYLLABUS

OFFICE HOURS: DEPARTMENTAL SYLLABUS

TELEPHONE: DEPARTMENTAL SYLLABUS


REQUIRED TEXT AND MATERIALS:
Contact the Bookstore (www.kckcbookstore.com) for the current textbook and supporting materials for this course.

COURSE DESCRIPTION:
The laboratory will consist of qualitative and quantitative biochemical experiments. Particular emphasis will be placed upon biochemistry laboratory techniques including: chromatography, spectroscopy, electrophoresis and computer modeling.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. Introduction to the Biochemistry Laboratory
   A. Safety
   B. Data Collection
   C. Reporting

II. Chromatography
   A. Protein Purification
   B. TLC of Dyes
   C. Protein Digestion and TLC
   D. Ion Exchange Chromatography
   E. HPLC
III. DNA Analysis
   A. Purification
   B. PCR Amplification
   C. Electrophoresis
   D. Endonuclease Digestion
   E. Aldehydes and Ketones
   F. Carboxylic Acids and Derivatives

IV. Colorimetric Analysis
   A. Carbohydrates, Proteins, Lipids, Nucleic Acids
   B. Enzyme Assays
   C. Inorganic Phosphate
   D. Vitamin C
   E. Photosynthesis

V. 3-D Modeling of Molecules and Database Analysis
   A. Proteins
   B. DNA

EXPECTED LEARNER OUTCOMES:

1. Perform biochemical experiments in a safe manner.
2. Analyze and present student experimental data in a prescribed written format.
3. Perform chromatographic techniques on biological molecules.
4. Correlate laboratory work with topics in biochemistry lecture.
5. Perform a variety of database searches utilizing protein or DNA sequences.
6. Utilize a variety of 3D modeling software to view and analyze protein and DNA structure.

COURSE COMPETENCIES:

1. The learner will be able to demonstrate safe laboratory practices.
2. The learner will be able to collect data in prescribed formats, (i.e., by SOP).
3. The learner will be able to prepare written reports according to the scientific method.
4. The learner will be able to purify proteins utilizing gel permeation techniques and quantitate protein concentration utilizing colorimetric assays.
5. The learner will be able to outline the procedure of TLC and utilize the technique for separation and identification of biological molecules.
6. The learner will be able describe how to purify a biological molecule by ion exchange chromatography.
7. The learner will be able to outline procedures utilized to purify DNA.
8. The learner will perform enzyme digestions of DNA and analysis of fragments by electrophoresis.
9. The learner will describe the theory of PCR and perform a PCR amplification of DNA.
10. The learner will describe the steps performed in colorimetric assays and perform such assays on biological molecules of interest.
11. The learner will describe the steps of SDS-PAGE and perform SDS-PAGE of protein samples.
12. The learner will describe and perform enzyme kinetic assays and classify inhibitors of the enzyme.
13. The learner will perform DNA and protein database homology searches and analyze obtained information.
14. The learner will be able to utilize 3D modeling programs to view and make predictions about protein and DNA structure.
ASSESSMENT OF LEARNER OUTCOMES:

Grades will be assessed on the basis of laboratory reports, a laboratory notebook, and a lab final

Final grades will be determined based upon the total number of points obtained.

Students entering physical science classes should be aware that they may be in close contact with potentially hazardous chemicals and equipment. The students should assume responsibility in conducting themselves in a manner to minimize such hazards. Students are required to attend a safety lecture and adhere to safe laboratory practices at all times in the laboratory. Students must assume the responsibility in conducting themselves in an adult manner and any disruptive or unsafe behavior will result in their removal from the class.

Note to Students Taking Online Classes:
The decision to take a class online as opposed to an onground class should be carefully considered before enrolling. It is true that online courses allow a student to be free of time and place. Class occurs when the student logs on to the computer at his or her convenience. It doesn't matter if it's 6:00 p.m. in the computing lab, Sunday afternoon at the local library, or 3:00 a.m. at home. The class will be there when the student is ready. That's a wonderful advantage to those with full time jobs, full time families, transportation problems, special needs or interests.

However advantageous online courses appear to be, please consider the following:

•Online courses require extreme self-discipline. One must log on and be prepared to read through many pages and comments. It must be done regularly (3 -5 times per week) or the process can take several hours.

•A great deal of time is spent visiting web sites, reading articles, dealing with technical problems. Technology is unreliable. The plan to submit homework at the last moment can be defeated with a busy or down server.

•Sometimes the cyberdog eats your homework. That is no excuse for not submitting homework. You should always have a copy saved to a disk so you can resubmit. Failure to do so leads to more work.

•Most people who have taken online courses will tell you that it is more 'labor intensive' than onground courses. It just takes more time. In an online course every student contributes to the discussion. That rarely happens onground.

•Online classes tend to be accelerated. That is, material is covered at a faster pace. It would not be uncommon for an online class to cover in 10 or 12 weeks what an onground class covers in 16. This may not always be the case but it is possible.

•If you are not highly motivated, disciplined, and patient, online courses are not the best option. There are other forms of distance education that may be more appropriate for you.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.
Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center, in Rm 3354 or call: 288-7670.