Course Syllabus: BIOL/BINF 5352: Introduction to Bioinformatics II Wet Lab (Spring 2014)

Instructor:
Lecture Professor: Dr. Stephen Aley is a molecular biologist specializing in infectious disease. He will provide his information in the lecture syllabus for this course.

Laboratory Professor: Dr. Jianying Zhang is a molecular biologist and epidemiologist specializing in cancer research. Office: B3.124, Lab: B3.200; Email: jzhang@utep.edu; Phone: 915-747-6995 (O); 915-747-5343 (L)

Teaching Assistant: We are fortunate to have --- (to be named later) as a teaching assistant for this course. --- will be responsible for the computer laboratory exercises and will have grade many of the assignments. His/Her office hours and contact information will be posted elsewhere.

Class Hours: W 0330-0550 pm, B3.200 (Dr. Zhang’s lab)
Office Hours: T, TR 0130-0300pm

Course Description and Objectives:
This is a continuation of Bioinformatics I from Fall semester. In the previous course, you studied the basics of sequence comparisons, multiple sequence alignment, pattern recognition, and tree construction on a limited number of identified sequences. In the current course, we will expand the application of these principles to real world genomic data and within the context of the cell. Topics include the assembly of sequence data into a proposed genome, identification and annotation of protein genes and metabolic pathways, determination of mRNA and protein expression, and advanced RNA analysis and folding. Time permitting, we may also investigate current, specialized topics of bioinformatics in research and industry. (from lecture syllabus by Dr. Aley)

In the genomic era (or post-genomic era, after human genome sequencing has been almost completed), DNA sequencing is increasing our knowledge of the molecular structure of genetic codes from bacteria to man at a hyperbolic rate. Billions of nucleotides and millions of amino acids are already filling the electronic files of the data bases presently available, which contain a tremendous amount of information on the most biologically relevant macromolecules, such as DNA, RNA and proteins. The crucial question is how to select the relevant pieces of information in order to focus the research activity on tractable problems. Intelligent tools are therefore needed to optimise the search. Data mining for sequence analysis in biotechnology has been substantially aided by the development of new powerful methods borrowed from the machine learning approach. The extraction and confirmation of information from entire and partially assembled genome sequences is currently available. This course includes the design and use of DNA arrays, SNP’s and applied proteomics in the identification and verification of expressed genes of interest.
Several wet lab exercises will be incorporated into this class. These wet lab exercises are intended to involve students in active learning, especially for students who are not from biological science background. There will be several wet lab sections including: Isolation of DNA/RNA and DNA sequencing; Protein purification and characterization; Proteomics; DNA microarray and microsatellites, and so on.

**Textbook:** None Required. Research literature will be provided.

**Activities/Assignments:**
Under the instructor’s direction you will attend the wet lab sections and learn several experimental approaches relating to this course. As described above, these wet lab exercises are intended to involve students in active learning, especially for students who are not from biological science background. Refer to the Department of Biological Sciences website for details regarding the research interests of my laboratory.

**Grading:** Your grade in this course is based on a combination of projects, lab reports and participation in class. Grades are based on a straight percentage scale; there is no curve and no +/- grades are awarded. So, an A=100-90%, a B=89.9-80%, a C=79.9-70%, a D=69.9-60%, and F=<60%.

**Make-up Policy:** There will be no make-ups as there are no exams and quizzes. Failure to turn in the final research summary will result in a grade of 0% for that assignment.

**Absence and Drop Policy:** It is your responsibility to attend the lab the required amount of time. If you have a serious illness or a legitimate excuse (includes military personnel called to active duty or training) for being out-of-town, make arrangements with me before you leave. **April 4** is the last day students may drop with an automatic “W”.

**Academic Integrity Policy:** UTEP’s policies regarding academic integrity apply in this course. Information on this policy can be found at [http://academics.utep.edu/Default.aspx?tabid=23785](http://academics.utep.edu/Default.aspx?tabid=23785)

**Civility Statement:** Please be respectful of all students’ right to learn without disruptions. In line with this statement please make an active effort to respect the other students working in the laboratories. Avoid making excessive amounts of noise and try to remember to turn your cell phone to vibrate mode.

**Disability Statement:** If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

**Note:** Wet Lab Section Schedule can be seen from the lecture syllabus by Dr. Aley.