**LABORATORY PRINCIPLES (BE 5382-013)**

**FALL SEMESTER 2010**

**ELB RM101 Fridays 9:00 am-1:00 pm**

**Dr. Mario I. Romero-Ortega**

Department of Bioengineering

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Class Lectures: ftp://students.uta.edu/ClassesFolders/bme5300-013

**Course Goal and Objectives**

This course will introduce students to the principles, applications, and design of instruments used in biomedical research, clinical evaluations and other relevant applications. Engineering laboratory data will be acquired from electrocardiograms, electroencephalograms, electromyography and lie detectors. As well as for other relevant physiological functions such as that of respiration, visual and cognitive testing. Data analysis will be perform and the results will be interpreted according to relevant physiological principles. Students will learn through in-class examples, homework problems, and active participation.

**Advice**

This course is fast paced and integrated. It is therefore very important that you keep up with study of the material. You should plan to read the chapter summaries before attending the lectures on the material.

**Recommended Text:**

BIOPAC Systems Reference Manual.

Publisher: BIOPAC Systems Inc.

 **Grading**

The course will contain two exams (200 points each), classwork and homework (400 points total) and a comprehensive project (200 points). Each exam will have fill in the blanks, multiple choice questions and/or problem solving assays. Your final grade will be estimated from *Exam I – II (40%), Classwork and homework (40%), and projects (20%)*. The scores will be averaged and a letter grade will be assigned where A > 90%, B > 80%, C > 70%, D > 60%, F < 60%.

**If you miss an exam, a grade of zero will be given.** **There is no provision for taking a make-up exam in this course unless documentation for a University-approved excuse (see Catalog) is received within one week of the exam date.** Note: UTA policy will not allow distribution of grade over the phone call or email. There will be no extra credit work to make up the grade and no mercy points will be given.

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| **Project**Students will work individually or in groups to design an experimental testing of human physiology.**Attendance and Drop Policy:**  |
| No mandatory attendance but missed class work will not be graded. If you are dropped from this class for non-payment of tuition, you may secure an Enrollment Loan through the Bursars Office. You may not continue to attend class until your Enrollment Lean has been applied to outstanding tuition fees. |

**Academic Dishonesty**

Academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form at The University of Texas at Arlington. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, 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. (Regents Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2., Subdivision 3.22)..

**Final Review Week**
A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabi. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week.

**Americans With Disabilities Act**
The University of Texas at Arlington is committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 -- The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans With Disabilities Act - (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

**Student Support Services Available**
The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals

**Disclaimer:** This on-line syllabus is provided for student convenience and is based on the most recent information available. There is no guarantee that the information is 100% accurate. If you have special concerns about course information, you are advised to contact the instructor.

**Lecture/Topic Schedule**

1. Friday 8/27 Introduction: *MP System Overview, Ethics and Statistics*

2. Friday 9/3 Pulmonary Function I: *Volumes, Flow Rate, and Capacities*

3. Friday 9/17Electrocardiography: *ECG I: Signal Averaged and Filtering*

4. Friday 9/24Electrocardiography: *ECG II: Dive Reflex and Variability*

5. Friday 10/1 Blood Pressure:*Response to Isometric or Straining Exercise*

6. Friday 10/8 Galvanic Skin Response: *Electrodermal Activity*

**Friday 10/15 Exam I**

7. Friday 10/22 Nerve Conduction and Intraoperative Monitoring: *CAP, SSEP, TcMEPs*

8. Friday 10/29 Electroencephalography*: EEG I/II,**Hemispheric Asymmetry/Fourier Transform*

9. Friday 9/10 Electromyography/Electrogastrogram

10. Friday 11/5 Reflexes and Reaction Time:*Fixed-interval and Pseudo-random Trials*

11. Friday 11/19 Auditory and Visual Evoked Potentials

12. Friday 11/12 Electrooculogram: *EOG**Eye Movement; Saccades, Tracking and Fixation*

Friday **11/26 Thanksgiving Holiday**

13. Friday 12/3 Exercise Physiology: *Cardiovascular & Respiratory Homeostasis*

14. Friday 12/10 Muscular Biofeedback: Relaxation and Arausal

**Friday 12/17 Final Exam**