LABORATORY PRINCIPLES (BE 5382-010)

SPRING SEMESTER 2016

ERB RM 279 **Wednesday 9:00 am-12:00 pm**
(see schedule below)

Dr. Ashwin Nair
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Office Hours: By appointment only.

Teaching Assistant: Mr. Amir Hakamivala
Office hours: After class 12:00 -14:00 (or by appointment) in ERB 279
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Class Lectures: Blackboard: elearn.uta.edu

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 electrocardiographs, electromyographs, electrooculographs and lie detectors. In addition, other relevant physiological functions such as respiration, visual and cognitive functions will be tested. Data analysis will be performed and results will be interpreted according to relevant physiological principles. Students will learn through in-class examples, homework problems, and active participation.

Recommendations for Regular Lab Sessions
You will work in groups of 3. It is very important that you keep up with the study material. Students are expected to know basic statistics (null & alternate hypothesis, testing hypothesis, tests for outliers etc.,). You should also plan to read the chapter summaries and lab procedures before class. Generally, lab data will be uploaded to Blackboard by Thursday evening. You have the weekend for working on the report. The schedule has no provision for repeating lab sessions, so please do not schedule your personal engagements during class timings.

Recommended Text:
BIOPAC Systems Reference Manual. (Available at the UTA Bookstore)
Publisher: BIOPAC Systems Inc.

Grading*
The course will contain:

- ✓ **Lab report and Questions & Answers** → **30%**
- ✓ **Special Topic Presentation** → **30%**
- ✓ **Project** → **40%**

There will be no additional grade curving in this course.
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.

Late reports will not be accepted. Reports are due at the beginning of every class and the class will begin as scheduled.
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.

Project: Students will work in groups of 3 to design an experimental test of human physiology. A hypothesis based experiment must be proposed and defended in class. You must then conduct the experiments and present your findings. Subjects must be students from BE 5382 and BE 4382. Specific instructions will be given as the semester progresses.

Special Topic Presentation: You must present as a group. You will be given a list of topics from which you can select one topic that you will make a presentation on. Your group will be randomly selected to present on a particular day. Hence you must have your presentation ready. Specific instructions will be given as the semester progresses.

Attendance and Drop Policy

There is no provision for repeating missed class. You will get a zero for the missed lab's report. If you are absent from class, please provide valid evidence that can be documented. Whether this documentation is acceptable will be determined by the instructor. If it is, then you may be able to submit a report for the missed lab.
Punctuality is very important as attendance will be taken at the beginning of every class. **If you are late for class, you will lose points in your report.** If you show up after 9:30 am, you will lose 10 points on your report. 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 Integrity
Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

> *I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*
>
> *I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Electronic Communication:
UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Student Feedback Survey
At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on

how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

Emergency Exit Procedures
Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, (please locate the nearest exits on the first day of class). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

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 on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX
The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Student Support Services
UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

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 or that there will be conformation to the daily schedule. If you have special concerns about course information, you are advised to contact the instructor.

Lecture/Topic Schedule

1. Wednesday 01/20 Introduction: *MP System Overview and Ethics.*

2. Wednesday 01/27 Reflexes and Reaction Time **(Q&A)**

Presentation topics will be given on this day. You must pick your topic and let us know as soon as you can, and prepare your presentation.

3. Wednesday 02/03 Electrogastrography **(Lab Report)**

4. Wednesday 02/10 Electromyography: *Motor unit recruitment* **(Q&A)**

5. Wednesday 02/17 Electrocardiography: *ECG: Dive Reflex and Variability* **(Lab Report)**

6. Wednesday 02/24 Exercise Physiology **(Q&A)**
Special Topic Presentation 2 groups

7. Wednesday 03/02 Pulmonary Function **(Lab Report)**
Special Topic Presentation

8. Wednesday 03/09 Galvanic Skin Response (GSR): *Electro Dermal Activity (EDA)*
Special Topic Presentation 2 groups

SPRING BREAK

9. Wednesday 03/23 Electrooculography **(Q&A)**
Special Topic Presentation 2 groups

10. Wednesday 03/30 Biofeedback: *Relaxation and Arousal* **(Q&A)**
Special Topic Presentation 2 groups

11. Wednesday 04/06 Electroencephalography: *EEG- Hemispheric Asymmetry* **(Lab Report)**
Special Topic Presentation

12. Wednesday 04/13 Proposal defense

13. Wednesday 04/20 Project

14. Wednesday 04/27 Project

15. Wednesday 05/04 Presentation

"As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Ashwin M. Nair."

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.