



## LABORATORY PRINCIPLES (BE 5382-010)

### SPRING SEMESTER 2017

ERB RM 279

Friday 9:00 am-11:50 am  
(see schedule below)

#### Dr. Ashwin Nair

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Office Hours: By appointment only.

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Office hours: by appointment in ERB 279

Class Lectures: Blackboard: [elearn.uta.edu](http://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 or 4. It is highly recommended that students work with different groups every week. This will help you form a project group that complements your work style and ethic. 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 Friday evening. 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:

✓ <u>Lab report</u>	→ 30%
✓ <u>Questions &amp; Answers</u>	→ 20%
✓ <u>Project</u>	→ 50%

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 or presentation, 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.**



**Lab Reports:** You are expected to work as a team in a group of 2 to prepare PowerPoint slides on all the labs. You must then email the slides as a PDF by the stipulated deadline. On the day of the presentation, you must make a 15 minute presentation on any one or two lab topics as determined by the instructor.

**Questions & Answers:** Specific questions for selected labs will be uploaded on Blackboard. Students must answer these questions and submit the assignment through the link provided on Blackboard.

**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. You will be making the presentation with the objective of educating your peers (undergraduate students, in this case). Hence you will be evaluated by them based on a rubric that will be provided to everyone and uploaded on Blackboard.

#### Attendance and Drop Policy

There is no provision for repeating missed lab sessions. 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](http://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](http://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](mailto:resources@uta.edu), or view the information at [www.uta.edu/resources](http://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. Friday 01/20 Introduction: *MP System Overview and Ethics.*

2. Friday 01/27 Electrocardiography: *ECG*

*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. Friday 02/03 Pulmonary Function

4. Friday 02/10 Reflexes and Reaction Time

5. Friday 02/17 Galvanic Skin Response (GSR): *Electro Dermal Activity (EDA)*

6. Friday 02/24 Special Topics Presentation

7. Friday 03/03 Electrogastrography

8. Friday 03/10 Electromyography: *Motor unit recruitment*

SPRING BREAK

9. Friday 03/24 Electrooculography

10. Friday 03/31 Exercise Physiology

11. Friday 04/07 Biofeedback: *Relaxation and Arousal*

12. Friday 04/14 Lab Report Presentation

13. Friday 04/21 Project

14. Friday 04/28 Project

15. Friday 05/05 Project 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.