

BMEN 3130-Engineering Physiology Lab Syllabus Spring 2014

Course Information:

Course Number/Section: BMEN 3130.006/3130.008
Course Title: Engineering Physiology Laboratory
Term: Spring 2014
Days and Time: Tuesdays 1:00 PM – 3:45 PM
Place: ECS S 4.415 & 4.416

Professor Contact Information:

Professor: Danieli Rodrigues
Office Phone: 972-883-4703
Other Phone: N/A
Email Address: danieli@utdallas.edu
Office Location: ECSS 3.905
Office Hours: Tuesday and Wednesday 4:00 -5:30 pm/ By appointment

Other Information: Lab manual and other relevant information will be posted on eLearning.

TA Contact Information:

TAs: Lucas Rodriguez, Shant Aghyarian, Jonathan Craven, Sathya Sridhar
Office Phone: N/A
Email Address: Lucas: lxr120230@utdallas.edu; Shant: sxa117530@utdallas.edu; Sathya: sxs125031@utdallas.edu; Jonathan Craven: jec042000@utdallas.edu
Office Hours: Sathya: Monday 4:00 – 5:00 pm; Lucas: Wednesday 2:00 – 3:30 pm; Shant: Thursday 1:00 -3:00 pm; Jonathan: Friday 9-11 am.
Other Location: TBD.

Course Pre-requisites, Co-requisites, and/or Other Restrictions:

Pre requisite RHET 1302 and Co-requisite BMEN 3330

Course Description:

Students will apply concepts of human physiology to understand and measure biological signals. Emphasis will be placed on understanding the state of the art tools available to measure biological signals and further apply that knowledge to understand the fundamentals of obtaining/analyzing these signals. The role of biological principles and phenomena will be highlighted in engineering terms.

Six laboratory experiments will be performed over the course of this class. Two weeks will be dedicated to each lab. In “Week 1” classes, students will discuss the current technologies related to the device of study. Groups will make presentations on the state of the art devices, literature searches, etc. Students will understand how the associated physiological parameter can be measured, how it is measured in industry, the downsides to current devices, and the circuitry behind measurement techniques. Students will also understand how the device will measure the parameter. In “Week 2” students will perform “hands-on” activities, learning how to set up the experiment, collecting and analyzing data.

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Course Learning Objectives:

1. Make connections between human anatomy/physiology and biomedical instrumentation.
2. Understand the origins of biomedical signals and how engineers can develop tools to measure/gain clinical data from these signals.
3. Understand the impact of biomedical engineering tools in a clinical context.
4. Function in teams and communicate effectively to solve bioengineering problem.

Reference Textbooks and Materials:

Medical Instrumentation – Application and Design,
John G. Webster (editor), 4th edition, 2010, Wiley
ISBN – 978-0-471-67600-3

Human Physiology: An Integrated Approach, 6th Edition
By Dee Unglaub Silverthorn
Published by Pearson
ISBN-10: 0-321-75007-1
ISBN-13: 978-0-321-75007-5

Suggested Course Materials:

All materials will be available through eLearning including the laboratory manual. Updated documents will be posted weekly.

Tentative Schedule:

Week	Dates	Topic	Relevant Book Sections (from Webster)	Pre-lab Activity	Post-lab Activity
1	1/13-1/17 (1/14)	Introduction	Chap. 1, Chap. 3	-	Read Relevant Book Sections
2	1/20-1/24 (1/21)	Surface temperature Week 1	Chap. 2.7-2.8 (p. 62-69)	Literature Report Due date: 1/21, by 12 pm on eLearning	Discussion Summary (Include within “Real World Applications” of Lab report)
3**	1/27-1/31 (1/28)	Surface Temperature Week 2		Read Relevant Book Sections	Lab Report Due date: 2/4, by 5 pm on eLearning

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4	2/3-2/7 (2/4)	Spirometer Week 1	Chap. 9.3-9.5 (p. 388-405)	Literature Report Due date: 2/4, by 12 pm on eLearning	Discussion Summary (Include within "Real World Applications" of Lab report)
5**	2/10-2/14 (2/11)	Spirometer Week 2		Read Relevant Book Sections	Lab Report Due date: 2/18, by 5 pm on eLearning
6	2/17-2/21 (2/18)	Hand Grip Heart Rate Monitor Week 1	Chap. 6.10 (287- 288); Chap. 4.6 (p. 147-158)	Literature Report Due date: 2/18, by 12 pm on eLearning	Discussion Summary (Include within "Real World Applications" of Lab report)
7**	2/24-2/28 (2/25)	Hand-Grip Heart Rate Monitor Week 2		Read Relevant Book Sections	Lab Report Due date: 3/9, by 5 pm on eLearning (note: extension due to midterm)
8	3/3-3/7 (3/4)	Midterm	Selections from Chap: 1-4, 6, and 9	-	-
9	3/10-3/14	SPRING BREAK	-	-	-
10	3/17-3/21 (3/18)	EKG Week 1	Chap. 6.1-6.7 (p. 241-275); Chap. 5.4-5.6 (p. 202- 208)	Literature Report Due date: 3/18, by 12 pm on eLearning	Discussion Summary (Include within "Real World Applications" of Lab report)
11**	3/24-3/28 (3/25)	EKG Week 2		Read Relevant Book Sections	Lab Report Due date: 4/01, by 5 pm on eLearning
12	3/31-4/4 (4/1)	Hand Dynamometer Week 1	2.1-2.4 (p. 45- 57)	Literature Report Due date: 4/1, by 12 pm on eLearning	Discussion Summary (Include within "Real World Applications" of Lab report)
13**	4/7-4/11 (4/8)	Hand Dynamometer Week 2		Read Relevant Book Sections	Lab Report Due date: 4/15, by

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					5 pm on eLearning
14	4/14-4/18 (4/15)	EMG Week 1	Sec. 4, 5 (p. 144-145);	Literature Report Due date: 4/15, by 12 pm on eLearning	Discussion Summary (Include within "Real World Applications" of Lab report)
15**	4/21-4/25 (4/22)	EMG Week 2		Read Relevant Book Sections	Lab Report Due date: 5/2, by 5 pm on eLearning (note: extension due to Final)
16	4/28-5/2 (4/29)	Final Exam	Selections from Chap. 2, 4, 6		

****denotes week of quiz.**

Grade distribution:

Lab Segments: 60% of total grade (10% per lab):

- We will perform six labs. Two weeks will be dedicated to each lab with a division of material described below:
 - o Week 1: Literature report and presentation/discussion, participation = 4%
 - o Week 2: Quiz = 2%, Post-lab report = 4%

Midterm: 20% - You will be expected to setup, perform and answer questions regarding experiments performed in class. You will schedule a timeslot within our regularly scheduled class to perform your midterm.

Final: 20% - You will be expected to setup, perform and answer questions regarding experiments performed in class. You will schedule a timeslot within our regularly scheduled class to perform your midterm.

%	97+	96.9% - 93.0%	92.9% - 90.0%	89.9% - 87.0%	86.9% - 83.0%	82.9% - 80.0%	79.9% - 77.0%	76.9% - 73.0%	72.9% - 70.0%	69.9% - 67.0%	66.9% - 63.0%	62.9% - 60.0%	≤59.9
Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

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Class work:

- All “Week 1” classes: Come to the classroom having already completed your Pre-lab (including having reviewed any relevant videos, readings, and with completed literature reports and or group presentations).
- All “Week 2” classes: Come to the laboratory having read the relevant book sections and lab manual, relevant videos, etc. and come prepared for a quiz.
- **Literature Report:** Each “Week 1” class will require a literature report to be submitted (via e-Learning). The contents of this report are outlined in a template document posted on e-Learning but will consist of a complete literature review and summary of the technologies that are available to acquire the biosignal referent to the week’s experiment. One literature report is required per group. The instructor will lead a discussion in each “Week 1” class, when the selected group will be responsible for presenting the background information. Physical copies of the report should be brought to class to facilitate participation in a discussion.
- **Group Presentations:** In addition to literature reports in “Week 1” class, 1-2 groups (depending on enrollment) will present their background research to the class. The group presentation (in power point format) will be submitted and posted on e-Learning. The instructor will lead the discussion when the selected student group(s) will be responsible for presenting background information. The grade for this activity will count as your participation for the week in which you present.
- **Laboratory and Associated Lab Report:** Groups will be formed during the first class. Each group will consist of 2-3 students. Each group member will participate in performing the lab during each “Week 2” class. A single lab report will be generated from the data gathered by all group members and submitted on e-Learning per the course schedule. The lab report will be prepared by all group members. Indicate by inclusion of your initials, which sections of each report you are responsible for [for example, Introduction (AC), Discussion (SP)]. Templates are posted on e-Learning. All raw and processed data must accompany the report for each participant.
- **Quiz:** There will be one quiz on “Week 2” class of each lab. Dates of quizzes are denoted by ** on the tentative schedule. Quizzes will test your preparedness in performing the lab and will cover topics presented in the lab manual to demonstrate you have read and understand the lab you are about to perform.
- **Participation:** TAs will document all participation in laboratory activities as well as discussion and presentation participation. This participation will factor into your grade.

Course & Instructor Policies:

- **Make up exams:** All students are expected to take the exams on the dates posted in the class schedule and as announced by the instructor. Unavoidable conflicts must be communicated to the instructor ahead of time. Missed exams without e-mail notification in advance of the absence will result in a grade of zero for the assignment or test.
- **Late work:** No late work will be accepted.
- **Group Presentations:** Group members absent on the day of their group presentation will not be awarded credit for the group presentation.

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- **Class attendance:** Class attendance is mandatory. Advance notice for any non-emergency absence to the instructor is expected. Student will lose credit for the day of non-participation in the class activity. Use of cellular phones and other electronic devices will result in your being marked absent. To be counted in attendance you must be both physically and mentally present.
- **Quiz(s):** No make-up quiz will be offered if a student is absent either for emergency or nonemergency situations.
- **Classroom citizenship:** Each student is expected to participate in the quizzes and associated discussion. TAs will mark student participation in class during lecture/discussions.

UT Dallas Syllabus Policies and Procedures:

Technical Support

If you experience any problems with your UT Dallas account you may email assist@utdallas.edu or call the UT Dallas Computer Help Desk at 972-883-2911.

Field Trip Policies, Off-Campus Instruction and Course Activities

No field trips are scheduled for this course. Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities.

Information regarding these rules and regulations may be found at:

http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean.

Student Conduct and Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UT Dallas printed publication, *A to Z Guide*, which is available to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Series 50000*, Board of Regents, The University of Texas System, and in *Title V, Rules on Student Services and Activities* of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online

At <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html>. A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

[Added July 2010] Students are expected to be attentive during class and to participate actively in group activities. Students are expected to listen respectfully to faculty and to other students who are speaking. Racism, sexism, homophobia, classism, ageism, and other forms of bigotry are inappropriate to express in class. Classes may discuss issues that require sensitivity and maturity. Disruptive students will be asked to leave and may be subject to disciplinary action.

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Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work. *Scholastic Dishonesty*: Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, submitting for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, or any act designed to give unfair advantage to a student or the attempt to commit such acts. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source, is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of *turnitin.com*, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice

The copyright law of the United States (*Title 17, United States Code*) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe upon the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy ([Policy Memorandum 84-I.3-46](#)). For more information about the fair use exemption, see <http://copyright.lib.utexas.edu/copypol2.html>.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's UT Dallas email address and that faculty and staff consider email from students official only if it originates from a UT Dallas student account. This allows the university to maintain a high degree of confidence in the identity of all individuals corresponding and the security of the transmitted information. UT Dallas furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at UT Dallas provides a method for students to have their UT Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal from any college-level courses. These dates and times are published in that semester's course inventory and in the academic calendar. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, a professor or other instructor cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in *Title V, Rules on Student Services and Activities*, of the university's *Handbook of Operating Procedures*. In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain

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primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

Office of Student Accessibility (OSA)

UT Dallas is committed to providing equal educational opportunities for students with documented disabilities to all University courses and programs. Any student with a documented physical, psychological, or learning disability, which affects his/her academic performance, is eligible for services. If you need classroom accommodations, please make an appointment with the Office of Student Accessibility at: SSB 3.200 (3rd Floor in SSB), 972-883-2098. Office hours are Monday – Thursday, 8:30 a.m. - 6:00 p.m., Friday 8:00 a.m. – 5:00 p.m. Evening appointments are available by request. <http://www.utdallas.edu/studentaccess/> OSA provides registered students with an accommodation letter to present to faculty members. The letter verifies that the student is qualified to receive certain accommodations. The accommodation letter should be presented to instructors of each course at the beginning of the semester. The approved accommodations should be discussed at that time. It is the student's responsibility to notify his/her professor of their needs. The University of Texas at Dallas is proud to be an educational institution that welcomes and supports a diverse student body.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, *Texas Code Annotated*. The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment. If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of *TEC 51.911(b)*, and the student and instructor will abide by the decision of the chief executive officer or designee.

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Avoiding Plagiarism

[Adapted from Duke University's guidelines for writers; added July 2010]. *Take time to make careful choices among--and learn to use--the research tools* available to you. You will probably find that your favorite web search engine is not adequate by itself for college level research. Consult with your professor or a librarian. You may need to use specialized research tools, some of which may require learning new searching techniques. *Expect to make trips to the library.* While you can access many of the library's resources from your home computer, you may find that you need to make several trips to use materials or research tools that are not accessible remotely. Of course, you will be seeking the best information, not settling for sources simply because they happen to be available online. *Allow time for gathering materials* that are not available at UT Dallas. The InterLibrary Loan Office can borrow articles and books from other libraries, but this process takes additional time. *Allow time for reading, rereading, absorbing information, taking notes, synthesizing, and revising your research strategy or conducting additional research as new questions arise.* *Sloppy note-taking increases the risk that you will unintentionally plagiarize.* Unless you have taken note carefully, it may be hard to tell whether you copied certain passages exactly, paraphrased them, or wrote them yourself. This is especially problematic when using electronic source materials, since they can so easily be copied and pasted into your own document. *Identify words that you copy directly* from a source by placing quotation marks around them, typing them in a different color, or highlighting them. (Do this immediately as you are making your notes. Don't expect to remember days or weeks later what phrases you copied directly). Make sure to indicate the exact beginning and end of the quoted passage. Copy the wording, punctuation and spelling exactly as it appears in the original. *Jot down the page number and author or title* of the source each time you make a note, even if you are not quoting directly but are only paraphrasing. *Keep a working bibliography* of your sources so that you can go back to them easily when it's time to double-check the accuracy of your notes. If you do this faithfully during the note-taking phase, you will have no trouble completing the "works cited" section of your paper later on. *Keep a research log.* As you search databases and consult reference books, keep track of what search terms and databases you used and the call numbers and URLs of information sources. This will help if you need to refine your research strategy, locate a source a second time, or show your professor what works you consulted in the process of completing the project. *You must cite direct quotes. You must cite paraphrases.* Paraphrasing is rewriting a passage or block of text in your own words. If you paraphrase, you must still cite the original source of the idea. *You must cite ideas* given to you in a conversation, in correspondence, or over email. *You must cite sayings or quotations that are not familiar, or facts that are not "common knowledge."* However, it is not necessary to cite a source if you are repeating a well-known quote or familiar proverb. Common knowledge is something that is widely known. For example, it is widely known that Bill Clinton served two terms as president; it would not be necessary to cite a source for this fact. *These types of sources should be cited as well. Printed sources:* Books, parts of books, magazine or journal articles, newspaper articles, letters, diaries, public or private documents; *Electronic sources:* Web pages, articles from e-journals, newsgroup postings, graphics, email messages, software, databases; *Images:* Works of art, illustrations, cartoons, tables, charts, graphs; *Recorded or spoken material:* Course lectures, films, videos, TV or radio broadcasts, interviews, public speeches, conversations

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.