

BMEN 3130-Engineering Physiology Lab Syllabus Spring 2016

Course Information:

Course Number/Section: BMEN 3130 Sections 101, 103-105

Course Title: Engineering Physiology Laboratory

Term: Spring 2016

Days and Time: Section 101- Thursday 10 am – 12:45 pm ECSS4.415 CASE

Section 103 – Monday 10 am – 12:45 pm ECSS 4.415 CASE

Section 104 – Thursday 1:00 pm – 3:45 pm ECSS 4.417 McNEELEY

Section 105 – Tuesday 1:00 pm – 3:45 pm ECSS 4.415 McNEELEY

Professor Contact Information:

Professor: Allison Case

Office Phone: 972-883-4949

Email Address: Allison.Case@utdallas.edu

Office Location: SPN 2.218 (Moving through the end of January), BSB 13.534

Office Hours: see eLearning

Professor Contact Information:

Professor: Kathleen McNeeley

Office Phone: 770-633-3706

Email Address: mcneeley@utdallas.edu

Office Location: SPN H4 (Moving through the end of January), BSB 13.306

Office Hours: TBD

TA Contact Information:

Mahdieh Mohammadi

Email Address: mxm141430@utdallas.edu

Office: ECSS 4.415

Office Hours See eLearning for the most up to date office hours, as they may change throughout the semester.

Timi Kehinde

Email Address txk142530@utdallas.edu

Office ECSS4.415

Office Hours See eLearning for the most up to date office hours, as they may change throughout the semester.

Lokesh Patil

Email Address lxp151030@utdallas.edu

Office ECSS4.415

Office Hours See eLearning for the most up to date office hours, as they may change throughout the semester.

Office Location: Indicated in the schedule below (ECSS4.415)

* You may visit ANY TA, not just the one for your section for help. Open office hours will be announced at the start of class.

Section and Office Hour Room Number and Times

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00:00 AM	Case OH (Subject to Change)				
10:00:00 AM	BMEN3130.103 Case	Timi OH ECSS4.415 (Subject to Change)		BMEN3130.101 Case	
11:00:00 AM					
12:00:00 PM					
1:00:00 PM		BMEN3130.105 McNeeley		BMEN3130.104 McNeeley	
2:00:00 PM					Lokesh OH ECSS4.415 (2:15 - 4:15 pm) (Subject to Change)
3:00:00 PM					
4:00:00 PM			Madieh OH ECSS4.415 (Subject to Change)		
5:00:00 PM					
6:00:00 PM					
7:00:00 PM					

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.

Course Learning Objectives:

1. Conduct experiments to quantify physiological markers of health using biomedical instrumentation. (B)
2. Interpret data of relevant biomedical signals to demonstrate understanding of the origins and routes of measurements. (B)
3. Function in teams to solve bioengineering problems and implement data analysis techniques. (D)
4. Communicate effectively by oral presentation and written reports. (G)

Required Textbooks and Course 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 Dee Unglaub Silverthorn

Published by Pearson
 ISBN-10: 0-321-75007-1
 ISBN-13: 978-0-321-75007-5

Understandings Biostatistics Thomas H. Hassard, Published by Mosby Year Books, ISBN-0:8016-2078-3. The department has purchased this book for your use in class this semester. You do not need to purchase your own copy, although you are welcome to do so if you would like to use it at home. There is one copy of Understanding Biostatistics in the library. A Course Reserve request has been filed so students can have access to the book in 24 hour increments outside of class.

Other Resources:

eLearning

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

Tentative Schedule: Subject to Change

Date	In Class Activities	Homework
MON 1/11/16	Syllabus Review Worksheet 1: Making Accurate, Precise Measures Worksheet 2: Excel Basics	Worksheet 3: How to Represent Data Read 'A Good Lab Report' and 'A Bad Lab Report' posted on eLearning. Write yourself a check list of habits to adopt and avoid for your own lab reports.
1/18/16	No class this week	Prelab 1* Understanding Biostatistics: Correlation
1/25/16	Worksheet 4: Making Physiologically Relevant Measurements ----- Lab 1: <i>Continuous Data</i> : Thermistors to Detect Skin Surface Temperature ----- Begin data tables and graphs in class. Get instructor approval of both before leaving	Make data tables, graphs
2/1/16	<i>Worksheet 5: Understanding Biostatistics Chapter 1</i> Worksheet 6: How to Make a Figure from Graphs Worksheet 7: Forming Scientific Conclusions Worksheet 8 Sections of a Scientific Report Worksheet 9: Formatting a Scientific ----- Lab Activity: Complete Lab 1 Data Tables and Graphs/Data Analysis Workshop	<i>Write Lab Report 1</i> PreLab 2
2/8/16	<i>Laboratory 2: Categorical Data: Hand Grip Heart Rate</i> ----- In Class: Complete Lab 2 Tables, Graphs; Rough Draft of Conclusions and Figures	<i>Write Lab 2 Report</i>
2/15/16	Worksheet 10: Sample vs. Population Worksheet 11: Data Assessment Styles <i>Worksheet 12: Understanding Biostatistics Ch2</i>	PreLab 3

2/22/16	Worksheet 13: Experimentation Worksheet 14: Experiments/Comparisons <i>Worksheet 15: Understanding Biostatistics Ch 3</i> Activity: Plan Lab 3 In Class; Assess Lab 1 and Lab 2 Data for Normalcy; Report CI for each data set	
3/1/16	<i>Worksheet 16: Understanding Biostatistics Ch4 Part 1</i> <i>Worksheet 17: Understanding Biostatistics Ch4 Part 2</i> Worksheet 18: Framing a Hypothesis Worksheet 19: The value of non-significant data (how to NOT commit scientific fraud.	
3/8/16	----- Laboratory 3 : EKG ----- In Class: Complete Lab 3 Tables, Graphs; Rough Draft of Conclusions and Figures	<i>Write Lab 3 Report</i> Midterm preparation
3/14/16	Spring Break	
3/22/16	Midterm Exam: Topics include but are not limited to- Hypotheses, Sample Size, Representing Data, Assessing , Normalcy, Controls, Avg, SD, SEM, Error bars, Sampling Rate, Frequency, Duration	PreLab 4
3/29/16	Worksheet 20: Breaking down “1 Lab” into multiple, simple experiments, measurements and comparisons ----- Laboratory 4: EMG ----- In Class: Complete Lab 4 Tables, Graphs; Rough Draft of Conclusions and Figures	<i>Write Lab 4 Report</i>
4/5/16	Design/ execute/analyze your own lab: Final Project	
4/12/16	Oral Presentation 1 Design/ execute/analyze your own lab: Final Project Proposed Experiment, Controls and Comparisons	
4/19/16	Design/ execute/analyze your own lab: Final Project	<i>Write Final Lab Report</i>
4/27/16	Final Exam THEORY Final Oral Presentation: Experiment	

*See *Classwork and Assignments* below for a description of the prelab.

Grade distribution:

15% Homework Worksheets/PreLab

15% In Class Worksheets

30% Lab Reports

10% Midterm Exam

20% Final Lab Experiment Project
10% Oral Presentations (2 x 5%)

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

Class work and Assignments:

Labs: Laboratories will be conducted in groups of 4 students. The lab report is group work and should represent equal contributions from all students. Formatting of laboratory reports is a significant part of the lab report grade. Numerous resources to aid in the proper formatting of your lab reports are available under 'Lab Formatting' folder on eLearning.

Prelabs/Quizzes/Homework/Exams: Each of these assignments is individual and should represent the individual student effort. Collaboration with other students or copying of outside resources is not allowed. All homework and prelabs are due by midnight the night before the following class unless explicitly stated differently in class.

Prelabs: A prelab for each laboratory consist of four parts:

Human Physiology: An Integrated Approach Worksheets (herein referred to as Physiology Worksheets). Available on eLearning in the 'Physiology Worksheets' Folder within the PreLab Folder

Medical Instrumentation: Application and Design Worksheets (herein referred to as 'Webster Worksheets'). Available on eLearning in the 'Webster Worksheets' Folder within the PreLab Folder

BMEN3130 Laboratory Manual: Read the lab manual associated with the upcoming lab. Familiarize yourself with the applicable hypotheses, equipment, materials, processes and procedures and expected outcomes. Available on eLearning in the 'Lab Manual' Folder within the PreLab Folder

Measurements Worksheet: Complete the Measurements prelab worksheet (posted on eLearning in the 'Measurements Worksheet Folder' within the PreLab Folder) to quantify the amplitude, frequency, sampling rate, experiment duration and other relevant facts related to the biosignal of interest).

In class worksheets: In class worksheets will be completed in pairs and should represent equal contribution of both students.

Course & Instructor Policies:

- **Failure to finish a lab during class:** If you do not finish a lab in lab class, you may go to your professor or TAs office hours to finish.
- **Attendance:** Class attendance is mandatory. Failure to attend a class without advanced notice will result in a 0 for the 'in class worksheet' activity as well as a zero for the 'lab report' grade. If you can't make it to lab to do an experiment then you cannot participate in the write up.
- 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. Teams may not write lab reports on behalf of the absent team member. 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.
- **Make up exams:** All students are expected to take quizzes and 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 **email notification in advance of the absence will result in a grade of zero for the assignment or test.**

- **Late work:** Late work will receive a penalty of 25% per day up to four days after which time it will not be accepted for any reason.
- **Group Presentations:** Group members absent on the day of their group presentation will not be awarded credit for the group presentation.
- **Quiz(s):** No make-up quiz will be offered if a student is absent without advanced notice or without documentation of an illness or emergency.
- **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.

Academic Integrity

All homework, quizzes, and exams are to be individual efforts. You are not to collaborate with other students, or to discuss homework assignments with other students prior to submission. Copying of homework, quizzes, or exams, in whole or in part, from other students or from assignments from previous semesters will be considered to be an act of academic dishonesty.

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. If academic dishonesty is suspected or confirmed, the student will be referred to the Dean of Students office. Until the Dean of Students return a verdict, assignments on which students are caught cheating will not be graded nor the points from these assignments awarded as part of the final grade.

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.

Privacy

UTD takes your privacy very seriously. I am unable to email you your grade or even discuss grades by email. Grades will be posted on eLearning and all questions regarding grades should be handled in office hours.

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 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.

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. *Not 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.