

## ***Course Syllabus***

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### **Course Information**

**BMEN 6373-501      Anatomy and Human Physiology for Engineers**  
**EEBM 6373-501**

**2016 Fall Semester**

### **Course Times**

Monday & Wednesday: 5:30pm-6:45pm   ECSN 2.120

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### **Professor Contact Information**

**Hyun-Joo Nam, Ph. D.**

**Phone: 972-883-5786**

**e-mail: [hnam@utdallas.edu](mailto:hnam@utdallas.edu)**

**Office: NSERL 4-706**

**Office Hours: Thu 10 AM-12 PM or by appointment**

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### **Course Pre-requisites, Co-requisites, and/or Other Restrictions**

None

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### **Course Description**

This course provides an introduction to anatomy and human physiology for engineers and other non-life scientists. Topics include eight physiological systems with selected topics with relevant engineering content discussed in greater depth. Examples include electrochemistry, *Hodgkin–Huxley* model, signal transduction, and biomechanics.

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### **PROGRAM LEARNING OBJECTIVES/OUTCOME**

PhD Program:

Prepare students for their professional careers by strengthening their knowledge in their specialization through independent inquiry and research in biomedical engineering.

M.S. Program:

1. Enhance student skills through formal education and training, and professional development in biomedical engineering.
2. Work independently, as well as collaboratively with others, while demonstrating the professional and ethical responsibilities of the biomedical engineering profession.

## **STUDENT LEARNING OBJECTIVES/OUTCOME**

This course was designed in the hope that, by its end, you will:

1. Understand basic terminology and concepts of human anatomy and physiology.
  2. Apply engineering models and quantitative skills to understand human physiology.
  3. Gain working knowledge which can be applied in bioengineering research areas.
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### **Required Textbooks and Materials**

Principles of Human Physiology, 5<sup>th</sup> or 6<sup>th</sup> Edition, Cindy L. Stanfield, Published by Pearson-Benjamin Cummings, ISBN: 10: 0134169808.

Older edition works too.

### **Suggested Course Materials**

Fundamentals of Anatomy and Physiology, 9<sup>th</sup> Edition, Martini/Nath/Bartholomew, 2012, ISBN: 0-321-70933-0

Quantitative Human Physiology An Introduction, Joseph Feher, 2012, Elsevier, Waltham USA, ISBN: 978-0-12-382163-8

**Course Web Site:** The eLearning course web site contains this syllabus and other useful links for the course. Log in using the information on p9.

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### **Assignments & Academic Calendar**

*(Topics, Reading Assignments, Due Dates, Exam Dates)*

1. Exams: 20% of course grade; Monday Sep. 26<sup>th</sup> 5:30-6:45 PM  
Monday Oct. 31<sup>st</sup> 5:30-6:45 PM  
Wednesday Dec. 14<sup>th</sup> (TBD) 5:00-7:45 PM
2. Paper: 20% of course grade  
A comprehensive literature review and analysis of a particular bioengineering topic area.  
First Draft due on Nov. 11<sup>th</sup>  
Peer Mark Review due on Nov. 18<sup>th</sup> (5%)  
Final Report due on Dec. 2<sup>nd</sup> (15%)
3. Homework: 15% of course grade: Due Monday Sep. 19<sup>th</sup> 5:30 PM  
Monday Oct. 24<sup>th</sup> 5:30 PM  
Monday Dec. 5<sup>th</sup> 5:30 PM
4. Short review report or presentation: 3% (presentation) 2% (report)
5. Participation: 2% of course grade: Lectures and discussion

### LIST OF LECTURES AND ASSIGNMENT

Date	A & P content	Chapters	Engineering/Pathophysiology
Aug 22	Introduction and course overview	1	
Aug 24	Introduction to physiology and cell	2	Systems Biology
Aug 29	Tissue/Metabolism	3	Tissue engineering
Aug 31	Membrane Physiology	4	Diffusion, Osmosis
Sep 7	Membrane Electrophysiology	7	HH Model
Sep 12	Chemical Messenger <b>PS1 in eLearning</b>	5	Pharmacology
Sep 14	Endocrinology	6	Hormone Replacement Therapy
Sep 19	Central Nervous system <b>PS1 due</b>	9	Parkinson's Disease/EEG
Sep 21	Sensory Nervous System 1	10	Cochlear Implant
<b>Sep 26</b>	<b>Exam 1</b>		
Sep 28	Sensory Nervous system 2	10	Visual Prosthesis
Oct 3	Muscle Physiology	12	biomechanics
Oct 5	ANS/Motor system	11	Exoskeleton
Oct 10	Cardiac Function	13	Signal Processing / ECG
Oct 12	Cardiac Function	13	Heart Devices
Oct 17	Blood Vessel <b>PS2 in eLearning</b>	14	Fluid Dynamics/ Stenting
Oct 19	Blood/Lymphatic	15	Biosensors
Oct 24	Respiratory System <b>PS2 due</b>	16	Pulmonary Disease
Oct 26	Respiratory System	17	Mechanical Ventilation
<b>Oct 31</b>	<b>Exam 2</b>		
Nov 2	Urinary System	18	
Nov 7	Urinary System	19	Kidney Stone/Lithotripsy
Nov 9	Digestive System	20	GI disorder/ GI endoscopy
<b>Nov 11</b>	<b>Term Paper Draft Due</b>		
Nov 14	Digestive System	20	
Nov 16	Endocrine System	21	Diabetes
<b>Nov 18</b>	<b>Peer Review Due</b>		
<b>(Nov 21-25)</b>	<b>Fall Break</b>	<b>No Class</b>	
Nov 28	Immune system		Immune Disorders
<b>Nov 30</b>	Immune System <b>PS3 in eLearning</b>		HIV

<b>Dec 2</b>	<b>Term Paper Final Version Due</b>		
Dec 5	Bone <b>PS3 due</b>		Biomaterials
Dec 7	Review		
<b>Dec 14</b>	<b>Exam 3</b>		

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## Grading Policy

<u>Grade</u>	<u>Description</u>	<u>Grade Points per Semester Hour</u>
A+		4.00
A	Excellent	4.00
A-		3.67
B+		3.33
B	Good	3.00
B-		2.67
C+		2.33
C	Fair	2.00
C-		1.67
D+		1.33
D	Poor	1.00
D-		0.67
F	Failure	0.00
I	Incomplete	
CR	Credit	
NC	No Credit	

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## Course & Instructor Policies

### Technical Support

If you experience any problems with your UTD account you may send an email to: [assist@utdallas.edu](mailto:assist@utdallas.edu) or call the UTD Computer Helpdesk at 972-883-2911.

### Field Trip Policies

#### Off-campus Instruction and Course Activities

*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 the website address*

[http://www.utdallas.edu/BusinessAffairs/Travel\\_Risk\\_Activities.htm](http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm). Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

## **Student Conduct & 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 UTD printed publication, *A to Z Guide*, which is provided 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.

## **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, 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.

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 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://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

### **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 U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD 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 U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

### **Withdrawal from Class**

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I 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.

### **Disability Services**

The goal of Disability Services is to provide students with disabilities equal educational opportunities. Disability Services provides students with a documented letter to present to the faculty members to verify that the student has a disability and needs accommodations. This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. It is the student's responsibility to notify his or her professors of the need for accommodation. If accommodations are granted for testing accommodations, the student should remind the instructor five days before the exam of any testing accommodations

that will be needed. Disability Services is located in Room 1.610 in the Student Union. Office hours are Monday – Thursday, 8:30 a.m. to 6:30 p.m., and Friday 8:30 a.m. to 5:00 p.m. You may reach Disability Services at (972) 883-2098.

Guidelines for documentation are located on the Disability Services website at <http://www.utdallas.edu/disability/documentation/index.html>

### **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.

### **HOW TO LOGIN TO THE BMEN 6373 WEBSITE**

All students are encouraged to enroll in the course web site. This will contain

1. Announcements
2. All the information in the syllabus
3. Lecture slides
4. Assignments



## Logging in to eLearning

1. Go to <http://elearning.utdallas.edu>
  2. Click **Academic** button
  3. Click the **Login** button
  4. Enter your user name and password ( Your university ID and PIN)
  5. You will be taken to the Course List page
  6. Click **BMEN/EEBM 6373 501: ANATOMY AND HUMAN PHYSIOLOGY FOR ENGINEERS - F16**
  7. Browse the contents.
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## Comet Creed

*This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:*

*“As a Comet, I pledge honesty, integrity, and service in all that I do.”*

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## UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

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