



Medical Applications of Engineering BE 1105/Tang & Nair 2016  
**Medical Applications of Engineering (BE 1105-005)**

**FALL SEMESTER 2016**  
COBA RM 245 West    Tuesday 4:00 pm -4:50 pm

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Office Hours: By appointment

Teaching Assistants & Email:

1. Ms. Ashley Dacy
2. Ms. Parisa Rabbani
3. Ms. Roshni Iyer

Office hours: After class (or by appointment)

Class Lectures: Blackboard: [elearn.uta.edu](http://elearn.uta.edu)

**Course Description**

Introduction to basic biology and engineering problems associated with living systems and health care delivery. Examples will be used to illustrate how basic concepts and tools of science & engineering can be brought to bear in understanding, mimicking and utilizing biological processes.

**Course Objectives**

This course focuses on familiarizing Freshman year and new students to the bioengineering discipline.

**Student Learning Outcomes**

This course will help students to:

- Appreciate how math and science principles can be applied towards answering medical questions
- Develop essential computational skills that will enable them to record and analyze data
- Work in groups to acquire and analyze data and present it through meaningful reports

**Course Pre-requisite**

None

**Recommendation**

It is very important that you keep up with the study material. In addition to the 1 hours in lab every week, you are expected to put-in around 3 hours per week towards this course. This would include reading required materials, completing assignments, preparing for exams, etc.

**Recommended Text:**

Notes will be provided by instructor

**Grading:**

Attendance → 30%



Assignments & Quizzes → 40%

Event Reports → 30%

The scores will be averaged and a letter grade will be assigned where A = 90% and above, B = 80% and above, C = 70% and above, D = 60% and above, F = 60% and below.

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. 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.

#### Attendance:

Attendance will be taken regularly and missed class work will not be graded. You are expected to sign in using the attendance sheet that will be provided when as you enter the class. You must carry your UTA ID (MAV Express) card with you to class. Timely attendance in this class is expected. It is important that class be started on time and proceed with minimal interruptions. **Arriving more than 10 minutes late will count as an absence.** You will also be required to sign out of class if you leave the classroom for any reason before the end of class. You will receive 5 points for arrival on time. You will lose 2 points for early departure from class.

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 Loan has been applied to outstanding tuition fees.

#### Drop Policy:

Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wwwb.uta.edu/aao/fao/>).

#### Academic Integrity

Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

##### 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,



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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>.

**Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

**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>.

**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.

**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.

**Disability Accommodations:** UT 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)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. 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 disability. Students are responsible for providing the instructor with official notification in the form of a **letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364. 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).



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Counseling and Psychological Services, (CAPS) [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

**Title IX:**

The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](mailto:jmhood@uta.edu).*

**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).

**The IDEAS Center** (2<sup>nd</sup> Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email [IDEAS@uta.edu](mailto:IDEAS@uta.edu) or call (817) 272-6593.

**The English Writing Center (411LIBR):** The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at <http://uta.mywconline.com>. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see [www.uta.edu/owl](http://www.uta.edu/owl) for detailed information on all our programs and services.

The Library's 2<sup>nd</sup> floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <http://library.uta.edu/academic-plaza>

**Librarian to Contact:** Mr. Martin Wallace - [martin.wallace@uta.edu](mailto:martin.wallace@uta.edu)  
817-272-3924

**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. If you have special concerns about course information, you are advised to contact the instructor.



Lecture/Topic Schedule

1. 08/30 Introduction - Dr. Ashwin Nair/Subject Librarian Mr. Martin Wallace
2. 09/06 Surgical Applications - Dr. Joseph Borrelli Jr
3. 09/13 Light-based Brain Stimulation & Imaging - Mr. Xinlong Wang
4. 09/20 Surgical Applications contd... - Dr. Joseph Borrelli Jr
5. 09/27 Tissue engineering - Dr. Liping Tang
6. 10/04 Bioinstrumentation - Dr. Khosrow Behbehani
7. 10/11 Cardiovascular Applications - Dr. Tre' Welch
8. 10/18 Microfluidics - Dr. Vinay Abhyankar
9. 10/25 Cardiovascular Surgeon - Dr. Jon Senkowsky
10. 11/01 Virtual Lab Tours
11. 11/08 Meet the Industry Professional - Mr. Steve VanNoy
12. 11/15 Senior Design Panel
13. 11/22 Nanocomposites for Tissue Interfacing & Magnetic Nanoparticles for Drug  
Delivery - Mr. Nikhil Pandey
14. 11/29 Summary - Dr. Ashwin Nair
15. 12/06 No class

*"As the instructor for this course, we reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Liping Tang & 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.