Welcome to UNT!
As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT’s full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

Instructor
Dr. Xiaodan Shi Xiaodan.Shi@unt.edu
Office: Discovery Park K240 J
Phone: 940-369-8950
Office Hours: appointment by email
Lecture: T and Th, 5:30-6:50 pm
Location: Discovery Park B157 or Zoom Meeting

Course Description
This comprehensive course covers the essential knowledge in biomedical implants. Our goal is to provide the students with knowledge and skills in understanding the medical needs, engineering principles in implant design, host-implant interaction, engineering restrictions and non-engineering restrictions in design optimization, and implant performance/clinical outcome assessments. Case studies include mechanical, bioprosthetic and transcatheter heart valves, vascular grafts, stents, pacemakers, orthopedic implants, dental implants, etc. In this course, we also cover the regulatory knowledge such as patent protection, design validation in animal models and clinical trials, IACUC, IRB, Good Manufacture Practice (GMP), and FDA regulations and approvals. Prerequisite(s): Graduate level

Course Objectives
The students are expected to (1) understand and identify the medical needs for biomedical implants; (2) have the essential knowledge of biomedical implants including engineering principles of biomedical implants, host-implant interaction, design procedure, design verification and validation, and performance assessments; (3) understand engineering restrictions and non-engineering restrictions, FDA regulations, patent, and commercialization issues related to biomedical implant industry; (4) The students are expected to be able to apply the learned knowledge to solve problems in the rapidly growing field of biomedical engineering.

ABET Outcome 1: Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Course Materials
No required textbooks. All course materials will be posted on Canvas including lecture notes, slides, assignments, reading, etc. Recommended references:


Major Assignments and Letter Grading

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
<th>Grade Range</th>
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</thead>
<tbody>
<tr>
<td>Mini presentations</td>
<td>10%</td>
<td>A 89.5 – 100%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
<td>B 79.5 – 89.4%</td>
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<tr>
<td>Presentation and paper review</td>
<td>10%</td>
<td>C 69.5 – 79.4%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
<td>D 59.5 – 69.4%</td>
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<tr>
<td>Exams</td>
<td>60%</td>
<td>F &lt; 59.5%</td>
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Important Dates

- Exam 1: 10/1, Th (5:30-6:50 pm)
- Exam 2: 12/8 (5:30-6:50 pm)
- BMES Annual meeting: 10/15 (no class)
- Thanksgiving holiday: 11/26 (no class)

Course Policies

Mini Presentation
A three-minute in-class mini presentation is required for each student every other week. Topics should be related to previous lecture discussions. Submit your slides to Canvas before class.

Homework
All homework should be submitted to Canvas in the format of MS Word or PDF. No late homework accepted. Do not email.

Oral Presentation
One in-class oral presentation is required for each student. Each presentation is scheduled 15-20 minutes with extra Q&A. Detail requirement and paper review template will be provided on Canvas later. Presentation topics can be chosen from any course-related original research (non-review/opinion) journal publications within 5 years (2015-2020).


Paper Review
One abstract-style paper review (same topic as oral presentation) is required for each student.
Detail requirement and template will be provided on Canvas later. Plagiarism is strictly prohibited. Turnitin will be applied for similarity check. Similarity report more than 20% will not be accepted.

Exams
Two sectional exams will be given remotely during the semester. Lockdown Browser with webcam is required. Each exam cover materials from the previous lecture section only. Exam questions will be a combination of multiple choices, true/false, short answers, fill in the blanks, matching, etc. Make-up exams will not be given without university-approved permission. https://policy.unt.edu/sites/default/files/06.039_StudAttnandAuthAbsence.Pub2_.19.pdf

Students who have more than two final examinations scheduled on one day may request to reschedule one of the examinations on another day during the final examination period as follows: https://registrar.unt.edu/exams/exam-policies

Attendance Policy
The University of North Texas recognizes that student success is promoted by regular attendance and participation in class. It is the responsibility of the faculty member to notify students in writing of any special attendance requirements for the class. This policy applies to all modes of course delivery. https://policy.unt.edu/policy/06-039

COVID-19 Impact on Attendance
While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.

If you are experiencing any symptoms of COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

Statement on Face Covering
Face coverings are required in all UNT facilities. Students are expected to wear face coverings during this class. If you are unable to wear a face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated via the instructor.
Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Class Materials for Remote Instruction

The UNT fall schedule requires this course to have fully remote instruction beginning November 28th. Additional remote instruction may be necessary if community health conditions change or you need to self-isolate or quarantine due to COVID-19. Additional required classroom materials for remote learning include: Respondus Lockdown Browser with webcam. Information on how to be successful in a remote learning environment can be found at https://online.unt.edu/learn.