**BMEN 4980/5800**

**Tissue Engineering and Regenerative Medicine (Spring 2020)**

**Instructor:** Dr. Xiaodan Shi  
**Email:** Xiaodan.Shi@unt.edu  
**Office Hours:** M-Th 2:00-3:00 pm, or by appointment (K240 J)  
**Section Information:** BMEN 4980/5800  
**Time and Place of Class Meetings:** T and Th, 8:30-9:50 am, D215

**Course Description**

Tissue engineering is increasingly viewed as the future of medicine. It is an extremely important area that provides new therapies for patients with severe injuries or chronic diseases. The successful development of tissue engineered replacements depends on complementary advances in medicine, cell biology, material science, and engineering are discussed in the course. This course is to develop the next generation of competent tissue engineers with a balanced background in both engineering and biology.

Prerequisites: Senior standing for 4980; Graduate standing for 5800

**Learning Objectives**

This comprehensive course is designed for both senior level and graduate student study. This course covers the fundamental concepts, multidisciplinary approaches, and clinical applications of tissue engineering and regenerative medicine. The students are expected to gain fundamental understandings of structure-function relationship in normal and pathological mammalian tissues. The principles of tissue engineering, biological mechanisms, experimental, analytical and computational approaches, animal models, as well as their respective clinical applications are integrated to address problems in current tissue regeneration field.

Brief list of topics to be covered:
- Cellular fundamentals of tissue engineering
- Tissue structure and functions
- Materials used for tissue engineering
- Fabrication techniques
- Applications of tissue engineering

**Textbooks and Other Course Materials:**

No required textbook. The covered content will be adapted from the following textbooks and current literatures. Lecture notes will be posted on Canvas as pdf files after class.

- **Tissue Engineering** by Clemens van Blitterswijk, Peter Thomsen, et al. (Academic Press, 2008)
- **Building Tissues – An Engineer’s Guide to Regenerative Medicine** by Joseph W. Freeman and Debabrata Banerjee (CRC Press, 2018)
Major Assignments and Grading

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<thead>
<tr>
<th>Assignment</th>
<th>BMEN 4980</th>
<th>BMEN 5800</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>10%</td>
<td>10%</td>
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<tr>
<td>Homework</td>
<td>15%</td>
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<tr>
<td>Exams</td>
<td>60%</td>
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<td>Group Presentation</td>
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<td>Paper Review</td>
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<td>Mini presentation</td>
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<tr>
<th>Grade</th>
<th>Percentage Range</th>
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<tr>
<td>A</td>
<td>89.5 – 100 %</td>
<td>92.5 – 100 %</td>
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<td>B</td>
<td>79.5 – 89.4 %</td>
<td>82.5 – 91.4 %</td>
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<tr>
<td>C</td>
<td>69.5 – 79.4 %</td>
<td>72.5 – 81.4 %</td>
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<td>D</td>
<td>59.5 – 69.4 %</td>
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Homework (15%)
- Homework is due on the designated date in class unless otherwise stated. The lowest homework grade will be dropped off.
- Late policy: same day after 12pm – 80%; next day – 50%; third day – 20%; forth day and forward – 0%.

Exam (60%)
- Two closed book/notes exams will be given during the semester, covering the previous lecture section only. There will be no final exam.
- Exam questions will be a combination of true/false, fill in the blanks, matching, multi choices, short answers, etc.

Group Presentation (10%)
- Students will work in groups of 2, unless otherwise assigned.
- Each group will give a 15(+5) min presentation (10%) to the class during the semester. All group members must present and participate during the presentation. Any group member that is not present for their group presentation will receive a zero for the project grade.
- Select your presentation date and time on Canvas by 3/5 (Th) 10 am.
- Topics and detailed rubrics of the presentation will be posted on Canvas later.

Paper Review (5%)
- One-page paper review (same topic as oral presentation) will be required for each student, due one week after your presentation date.
  Each paper review should include research title, background, material/method, results, conclusion, and necessary citations. Template will be posted on Canvas later.
- Submit your paper review (word document) to Canvas.
- Turnitin will be applied for similarity check. Similarity report more than 20% will be considered Plagiarism and will not be accepted, resulting in a zero grade.
**Mini Presentation (5%)**

- Five in-class mini presentations will be required for students who registered as 5800, during the semester.
- Each mini presentation should be prepared as PowerPoint format (no more than 3 slides) within 3-5 minutes.
- Topics of mini presentation should be selected from previous week, course-related, non-publication article or news.
- Late policy: next class – 50%; two classes – 20%; three classes – 0%.

**Important Dates**

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<tr>
<th>Date</th>
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<tr>
<td>2/25</td>
<td>Exam 1</td>
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<td>3/5</td>
<td>Select your presentation date and time</td>
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<td>3/10-12</td>
<td>Spring Break, No Class</td>
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<td>4/2</td>
<td>Group Presentation Day 1</td>
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<td>4/9</td>
<td>Group Presentation Day 2</td>
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<td>Group Presentation Day 3</td>
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<td>Group Presentation Day 4</td>
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<td>4/30</td>
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Registration, Drop and Withdrawal Policy

Drop: It is the student’s responsibility, and not the instructor’s, to drop the course. You may find important details about how dropping a class can affect your GPA and your Financial Aid here: [http://registrar.unt.edu/registration/dropping-class](http://registrar.unt.edu/registration/dropping-class)

Withdrawal: It is the student’s responsibility to withdraw from the course by either going to their academic advisor’s office (which should be the first stop when considering a withdraw), the Registrar’s office, or the Department. If you can’t complete the course, you must withdraw for a “W” (after this date, you’d receive either a “WP” or a “WF”). Withdrawing from a course is a formal procedure which YOU must initiate. I can’t do it for you. If you simply stop attending and do not withdraw, you will receive a performance grade, usually an “F.” All deadlines can be found at: [http://registrar.unt.edu/registration/fall-registration-guide](http://registrar.unt.edu/registration/fall-registration-guide)

University Policy on Academic Misconduct

**Academic Misconduct** (Sec. 3.4 from the Student Handbook):
Any act that violates the academic integrity of the institution is considered academic misconduct. The procedures used to resolve suspected acts of academic misconduct are available in the offices of Academic Deans and the Office of Campus Life. Specific examples include, but are not limited to:

**Cheating**: Copying from another student’s test paper, written assignment, other report, or computer files and listings; Using, during any academic exercise, material and/or devices not authorized by the person in charge of the test; Collaborating with or seeking aid from another student during a test or laboratory without permission; Knowingly using, buying, selling, stealing, transporting, or soliciting in its entirety or in part, the contents of a test or other assignment unauthorized for release; Substituting for another student or permitting another student to substitute for oneself.

**Plagiarism**: The appropriation, theft, purchase or obtaining by any means another’s work, and the unacknowledged submission or incorporation of that work as one’s own offered for credit. Appropriation includes the quoting or paraphrasing of another’s work without giving credit (especially online resources). Turnitin will be utilized to ensure online resources are not misappropriated.

Any work not meeting this standard will be evaluated and subject to either a re-write, if the Instructor concludes that the assignment was unintentionally plagiarized or a zero for the assignment. Egregious forms of academic conduct are subject to a formal hearing. For more information on paper writing, including how to avoid plagiarism, and how to use citations, see [http://anthropology.unt.edu/resources-writingpaper.php](http://anthropology.unt.edu/resources-writingpaper.php). For information on the University’s policies regarding academic integrity and dishonesty, see the UNT Center for Student Rights and Responsibilities, [http://www.unt.edu/csrr/](http://www.unt.edu/csrr/).

**Collusion**: The unauthorized collaboration with another in preparing work offered for credit.

**Sexual Discrimination, Harassment and Assault**

UNT is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these acts of aggression, please know that you are not alone. The federal Title IX law makes it clear that violence and harassment based on sex and
gender are Civil Rights offenses. UNT has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more.

**Personal Distress**

Excerpts from [http://studentaffairs.unt.edu/care](http://studentaffairs.unt.edu/care) “The University of North Texas cares about our students' success, not only academically, but emotionally and physically.... Because of our commitment, we provide literally hundreds of departments and services across campus that respond to our students' unique needs.... UNT believes it is important to foster an environment that encourages students to maintain a standard of responsibility for self-care which includes the ability to respond adequately to one's emotional, physical, and educational needs. If you are experiencing physical or emotional distress which adversely affects your ability to succeed in class, please see me as soon as possible. Together, we will point you towards the appropriate resources.