

# BSC 561

## Bioremediation

### Courses Syllabus: Spring, 2020

Instructor: Dr. Lin Guo

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Phone: 903-886-5371

Classroom: Web based class

Office location: Science building 234

Office hr: 8:00–5:00 pm online M-F

Fax: 903-886-5997

Time: 1/13/20-5/8/20

**Text Book:**

No book is required. The teaching materials or link of resources are provided in D2L.

**Course Description:**

Bioremediation is the applications of living organisms (e.g. plants and microorganisms) to remediate contaminated soils and waters. Microorganisms can degrade toxic compounds to less toxic or non-toxic compounds; plants can uptake or immobilize toxic contaminants to prevent pollutants from entering non-contaminated areas. Further, microorganism and plants may interact with each other to enhance the bioremediation efficiency.

As an introduction course, it includes an overview of the bioremediation process; describe the typical bioremediation strategies for contaminated environment; explore the applications of bioremediation technologies; discuss the factors that influence the bioremediation rates; and introduce success cases in the application of bioremediation technology to contaminated sites

**Instructional Method:**

Lecture, discussion, quizzes and papers

**Learning Objectives:**

Upon completion of this course you should be able to:

1. Understand the nature and importance of bioremediation;
2. Know the influence of site characteristics to bioremediation rates;
3. Have a knowledge of the impacts of contaminant characteristics to bioremediation process;
4. Understand the use of bioremediation in real world applications;

<b>Evaluations:</b>	quizzes	50 points	A $\geq$ 90%
	Term-paper	50 points	B $\geq$ 80%
	Article reviews	50 points	C $\geq$ 70%
	Discussions	50 points	D $\geq$ 60%
	Total	200 points	F<60%

**Quizzes:** please complete quizzes after studying the lecture of some units.

**Term-paper:** Write a term paper to discuss a case study of bioremediation project; In this paper, you will need to introduce the background of the project, the details of the project (i.e. the strategies of bioremediation), the results of the project, and the suggestions for future; Use 12 pt font, 1.5 line spacing; Number your pages (more than 4 pages); Due on or **before 5 pm on May 1;**

**Article reviews:** you need to read find journal articles about bioremediation from library, read it and submit a brief review. The review should be typed (12 pt font, 1.5 line spacing) and include two full paragraphs. First, conclude the opinions of the article (about one half to one page). In the second paragraph (about one half to one page), please critique of the article with substantive or evidence-driven arguments for or against the opinions of the article.

The topics of the articles will be related to **bioremediation by microorganisms and phytoremediation.**

**The first paper is due on or before 5 pm on Feb 14; the other due on or before 5 pm on Mar 6.**

Any paper that is not properly referenced will receive a zero. Late paper is not accepted.

**Discussion:** Participate in the online discussions. Post your own thoughts. Post at least one comment to each question posed by the instructor. Read the postings of others and respond (at least two peer review responses are needed). Your level of participation - both quantity and quality - is part of your participation grade. Discussions will open for one week. It will close at midnight of Friday. I encourage you to do it as earlier as possible.

**Topics:**

- Week 1-2 Jan 13-24: Overview;
- Week 3-4 Jan 27-Feb 7: Introduction of bioremediation
- Week 5 Feb 10-14: Process of bioremediation
- Week 6 Feb 17-21: Hazardous pollutants
- Week 7 Feb 24-28: Methods of Wastewater treatment
- Week 8 Mar 2-6: Bioremediation of wastewater
- Week 10 Mar 16-20: Bioremediation of contaminated soil
- Week 11 Mar 23-27: in situ bioremediation of soil
- Week 12 Mar 30-Apr 3: Ex situ bioremediation of soil
- Week 13-14 Apr 6-17: Treatment of common contaminants
- Week 15-16 Apr 20-May 8: Bioremediation in practice

**University Procedures:**

**Students with Disabilities:**

The Americans with Disabilities Act (ADA) prohibits discrimination against people with disabilities in employment, transportation, public accommodation, communications, and governmental activities.

If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services, Texas A&M University-Commerce

Gee Library- Room 132

Phone (903) 886-5150 or (903) 886-5835 Fax (903) 468-8148 Email: [Rebecca.Tuerk@tamuc.edu](mailto:Rebecca.Tuerk@tamuc.edu)

Website: Office of Student Disability Resources and Services

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

**TAMUC Attendance:**

For more information about the attendance policy please visit the Attendance webpage and Procedure

13.99.99.R0.01. <http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

**Academic Integrity:**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/>

es/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

**Nondiscrimination Notice:**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

**Student Conduct:**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.

<http://www.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette <http://www.albion.com/netiquette/corerules.html>

**Early Intervention for First Year Students:**

Early intervention for freshmen is designed to communicate the University's interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester.

**Campus carry rules:**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to

(<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>) and/or consult your event organizer). Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

### **Technology Requirement**

#### **D2L Access and Log in Information**

This course will be facilitated using D2L, the learning management system used by Texas A&M University-Commerce. To get started with the course, go to myLeo, then select Apps, and then select myleo online (D2L Brightspace).

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

If you are having technical difficulty with any part of D2L Brightspace, please contact Brightspace Technical Support at 1-877-325-7778.

#### **Interaction with Instructor Statement**

If you have questions pertaining to the content of this course, please contact me via email. Generally, emails will be answered within 24 hrs. If I can not answer emails on time, I will let you know in advance.