

**SWS6366****BIODEGRADATION AND BIOREMEDIATION**

3 credit hour (Web based only)

**COURSE DESCRIPTION:** This course will present the basic principles of chemical and biological degradation of toxic chemicals, and familiarize the students with the application of the remedial technologies in natural environments. Topics covered will include: 1) occurrence and ecological significance of toxic organic chemicals, 2) chemistry of contaminants, kinetics and mechanisms of degradation (chemical and biological), and 3) current technologies of bioremediation of contaminated soils and water.

**INSTRUCTORS:****Dr. Kanika Sharma Inglett,**

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**TIMES:** Every Spring semester

**ENROLLMENT CAP:** 20

**ONLINE MEETINGS/CHATS:** Tuesday 6:30p.m to 7:30 U.S. Eastern Time

**DELIVERY MODE:**

- Course material is provided Online at: <https://lss.at.ufl.edu/> (Links to an external site.). Be sure to click on “E-learning in Canvas” on left side. Course number is SWS6366.
- Course material will include MS Power Point slides, reading material in pdf format, e-lectures, quizzes, and hyperlinks.
- Email and message (bulletin) board are used for asynchronous communication
- Adobe Connect online meeting system is used for chats (synchronous communication):  
Chat sessions: 6:30p.m to 7:30 U.S. Eastern Time

**Direct link to chat:** <http://mbreeze.ifas.ufl.edu/sws6366chat/> (Links to an external site.)

- VoiceThread is free and available for student presentations. To access VoiceThread, go to <https://ufl.voicethread.com> (Links to an external site.) and login with your gatorlink username and password. Click for [User guide](#) (Links to an external site.)

**COURSE PREREQUISITES:** Computer with high-speed internet access (e.g. DSL, cable modem, or satellite modem) with web camera and microphone. Basic knowledge of organic chemistry and microbiology will be required to follow the material in this course.

**SOFTWARE:** Windows operating system, Microsoft Office, and Adobe Reader.

### **COURSE OUTLINE:**

#### **Chemical aspects- SECTION 1**

- *Biodegradation- Detoxification Reactions*
- *Biodegradation- Activation Reactions and Sorption*
- *Chemical Structure & Biodegradation Potential*
- *Predicting Biodegradation Products*
- *Bioremediation of organic and inorganic pollutants*
- *Remediation Technologies*

#### **Microbial aspects- SECTION 2**

- *Introduction and historical perspectives*
- *Strategies of microbial degradation and bioremediation*
- *Kinetics of biodegradation*
- *Molecular biology of biodegradation*
- *Examples of bioremediation*
- *Advances in microbial remediation*

#### **In general student responsibilities include:**

1. Students are expected to study the appropriate text sections and suggested outside readings in anticipation of lecture coverage.
2. Students are expected to actively participate in discussion sessions.
3. Students are expected to complete all assignments/quizzes when offered. No make-up quizzes will be allowed unless agreed upon by the instructors.
4. Students are expected to demonstrate their mastery of presented material by passing written examinations and successfully completing assigned homework.

## **STUDENT ASSESSMENT:**

1. You are expected to attend and be prepared to participate in all discussion sessions. Personal issues with respect to discussion sessions or fulfillment of course requirements will be handled on an individual basis. A portion of the grade is based on meaningful class participation, demonstrated student interest, and overall student dedication.
2. Assessments for each section are based on exams, quizzes, online-discussions and participation, class presentations. Specifics will be discussed in class.
3. Course grades will be determined as follows (%)

### **Grading Scale**

A	93% and above	C	73-76.99%
A-	90-92.99%	C-	70-72.99%
B+	87-89.99%	D+	67-69.99%
B	83-86.99%	D	63-66.99%
B-	80-82.99%	D-	60-62.99%
C+	77-79.99%	E	Below 60

**RECOMMENDED BOOKS:** There is **no required text** for this course. However, we recommend the Alexander's text. This will provide the extra clarification for some topics.

*Additional handouts and reading references to specific topics will be given during the semester. (See Reading and Chat Schedule)*

- Biodegradation and Bioremediation, M. Alexander (1999), Academic Press, New York.

## **ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:**

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (<http://oss.ufl.edu/> ([Links to an external site.](#))). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

## **ACADEMIC HONESTY:**

As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic

honesty, and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the University.” Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details: [www.dso.ufl.edu/judicial/procedures/academicguide.php](http://www.dso.ufl.edu/judicial/procedures/academicguide.php) (Links to an external site.)).

### **UF COUNSELING SERVICES:**

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information:

<http://www.counsel.ufl.edu/> (Links to an external site.)

or <http://www.health.ufl.edu/shcc/smhs/index.htm#urgent> (Links to an external site.)

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: [www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc) (Links to an external site.)

Crisis intervention is always available 24/7 from:

Alachua County Crisis Center: (352) 264-6789.

*BUT – Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.*

### **SOFTWARE USE:**

All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

### **DE COMPLAINTS**

Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See <http://distance.ufl.edu/student-complaints> (Links to an external site.) for more details.