

ABE 6266

Nanotechnology in Water Research

- 1. Catalog Description:** *3 credits.* Lecture 3 hours. This course provides an overview of the research and application of environmental nanotechnology such as engineered nanomaterials, nanosensors, nano-remediation, water treatment, transport process, and modeling. Hands-on experiments and course projects are required. (*Offered in Fall*)

- 2. Pre-requisites and Co-requisites:** None

- 3. Course Objectives:**
 - Gain fundamental knowledge about the terminology, techniques, and recent advances in the field of environmental nanotechnology, water treatment, and hydrology.
 - Understand the impact of nanotechnology on water quality, particularly with respect to the applications of nanotechnology to water pollution, and the control, fate and transport of nanomaterials in hydrologic pathways.
 - Develop skills to identify, formulate, and solve problems in water quality.
 - Develop skills in using nano-engineering tools necessary for the practice in environmental nanotechnology and water quality field.
 - Develop skills in written and oral communication.
 - Develop teamwork skills.

- 4. Instructor:** Dr. Bin Gao
 - Office location : 285 Rogers Hall
 - Telephone: 352-392-1864 x 285
 - E-mail Address: bg55@ufl.edu
 - Office hours: walk-in or by appointment

- 5. Meeting Times:** TBD

- 6. Meeting Location:** Frazier Rogers Hall (TBD)

- 7. Teaching Assistant:** None

8. Textbooks and Software Required: None

9. Course Outline:

Topics	
1	Nanotechnology and Environmental Nanotechnology
2	Environmental Benefit of Nanotechnology
3	Applications of Nanotechnology to Water Pollution Control: Sensors
4	Applications of Nanotechnology to Water Pollution Control: Remediation
5	Applications of Nanotechnology to Water Pollution Control: Membranes
6	Applications of Nanotechnology to Water Pollution Control: Adsorbents
7	Environmental Risk of Nanotechnology: Student Presentations
8	Nanoparticles in Water: Characterizations
9	The DLVO Theory
10	The Classic Filtration Theory
11	Nanoparticles in Hydrologic Pathways
12	Fate and Transport of Nanoparticles: Surface
13	Fate and Transport of Nanoparticles: Subsurface
14	Laboratory Experiment of Nanoparticle Transport and Filtration in Porous Media

10. Grading:

Grading Method	Percentage
Homework and Class Participation	30%
Project Presentation	30%
Laboratory Project	40%
Total	100%

Grading Scale: **A** ($\geq 90\%$), **A-** ($\geq 87\%$ and $< 90\%$), **B+** ($\geq 84\%$ and $< 87\%$), **B** ($\geq 80\%$ and $< 84\%$), **B-** ($\geq 77\%$ and $< 80\%$), **C+** ($\geq 74\%$ and $< 77\%$), **C** ($\geq 70\%$ and $< 74\%$), **C-** ($\geq 67\%$ and $< 70\%$), **D** ($\geq 60\%$ and $< 67\%$), **E** ($< 60\%$)

11. Attendance and Expectations: Students are expected to arrive on time and attend all classes. Cell phone use is not allowed during class. Homework assignments are due in class on the day specified for full credit (10% deduction/day thereafter). Students are expected to participate in discussion and have read assigned readings.

12. Make-up Exam Policy: None, no exam given.

13. Honesty Policy: All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

14. Accommodation for Students with Disabilities – Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

15. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.

- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

16. Software Use – All faculty, staff and student 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. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.