

**ABE 6266**

**Nanotechnology in Water Research**

- 1. Catalog Description:** *3 credits. Applications of environmental nanotechnology to water quality control. Fate and transport of nanomaterials in hydrologic pathways.* This course provides an overview of the research on applications and implications of environmental nanotechnology such as engineered nanomaterials, nanosensors, nano-remediation, water treatment, water quality, transport process, and modeling. (*Offered 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 contaminant fate and transport.
  - Understand the impact of nanotechnology on water quality, particularly with respect to the applications of nanotechnology to water pollution control, and fate and transport of nanomaterials in hydrological 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: 352-294-6746
  - E-mail Address: [bg55@ufl.edu](mailto:bg55@ufl.edu)
  - Office hours: by appointment
  
- 5. Meeting Times:** T & R; Period 4 - 5 (10:40 AM - 12:35 PM)
  
- 6. Meeting Location:** 211 Frazier Rogers Hall

**7. Teaching Assistant:** TBD

**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	Nanoparticles in Water: Characterizations
8	The DLVO Theory
9	The Classic Filtration Theory
10	Nanoparticles in Hydrologic Pathways
11	Fate and Transport of Nanoparticles: Surface
12	Fate and Transport of Nanoparticles: Subsurface

**10. Grading:**

Grading Method	Percentage
Class Participation	40%
Presentation	30%
Final Report	30%
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. Online Course Evaluation Process:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

**14. Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: “*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*”

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://sccr.dso.ufl.edu/process/student-conduct-code/>.

**15. 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.

**16. Services for Students with Disabilities:** The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.  
0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)

**17. UF Counseling Services:** Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,  
[www.counseling.ufl.edu](http://www.counseling.ufl.edu)  
Counseling Services  
Groups and Workshops  
Outreach and Consultation  
Self-Help Library  
Wellness Coaching

- U Matter We Care, [www.umatter.ufl.edu](http://www.umatter.ufl.edu)
- Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>

**18. Student Complaints:**

- Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
- Online Course: <http://www.distance.ufl.edu/student-complaint-process>

**19. Online Recording Statement:** The class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

**COVID-19**

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email [covid@shcc.ufl.edu](mailto:covid@shcc.ufl.edu)) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.