



CIVE440: NONPOINT SOURCE POLLUTION

INSTRUCTOR INFORMATION

Instructor: Dr. Bhaskar

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Pronouns: she/her

Communication Policy: To ask questions outside of class time: (1) Subscribe to and post on the Canvas discussion board or (2) attend office hours. If the question is of a personal nature, email me at aditi.bhaskar@colostate.edu with CIVE440 in the subject line.

COURSE MODALITY AND CONNECTION

This course is scheduled for distance delivery (100% online) for the Spring 2021 semester, and will have a synchronous component which is at the scheduled class time of Tuesday and Thursday from 11-12:15 MT on Zoom at:

<https://zoom.us/j/97659291914?pwd=b2EzdllCWVE1Z0ZqQnVQSjNjLytlQT09>.

OFFICE HOURS

Office hours are from 2-3 pm on Thursdays or by appointment on Zoom at:

<https://zoom.us/j/99555950330?pwd=Rk9LRWYrQk90WGFUR2Z1VFEwdkhFZz09>.

I encourage you all to come to office hours to discuss course material, questions, homework, or just chat with me and others in the course about your interests related to nonpoint source pollution.

PREREQUISITES FOR COURSE

CIVE 300 or CIVE 322 or SOCR 240 or WR 416 or CBE331.

COURSE DESCRIPTION

Principles, processes, and control of nonpoint source pollution. Particular emphasis is placed on non-point source (NPS) problems associated with urban runoff, agricultural influences on water quality, and impacts of mining and forestry. Surface and ground water pollution in diverse



aquatic systems including stream, river, lake, reservoir, estuarine environments are considered. Students are exposed to a variety of structural and non-structural management practices.

COURSE PURPOSE

This course familiarizes students with the nature and extent of non-point source (NPS) problems, the fundamental processes that govern the fate and transport of diffuse pollution, and the design of effective pollution abatement measures.

TEXTBOOK / COURSE READINGS

Available through CSU e-Course Reserves on Canvas: Novotny, V. 2003. Water Quality: Diffuse Pollution and Watershed Management. 2nd Edition. John Wiley and Sons, New York.

Selected journal articles and other readings will be distributed via Canvas.

COURSE OBJECTIVES

Upon the completion of this course, students will be able to:

1. Define the major components of the hydrologic cycle and describe how they affect surface runoff, subsurface flow, groundwater recharge, and surface and groundwater quality;
2. Describe ways of measuring or estimating the hydrologic fluxes that are important in nonpoint source pollution;
3. Describe the major chemical, physical, and biological processes affecting the fate and transport of nutrients, pesticides, sediment, heavy metals, and other pollutants in the soil, surface runoff, and groundwater;
4. Describe the most important legislation and regulations associated with nonpoint source pollution;
5. Perform rainfall-runoff, erosion, return period, and flood frequency calculations;
6. Design stormwater conveyance channels, filter strips, and settling ponds;
7. Compute retardation coefficients and degradation rates for pesticides;
8. Describe eutrophication and estimate limiting nutrient loading rates;
9. Perform wetland design calculations for removal of nitrogen and other pollutants;
10. Estimate long-term average annual soil loss using the USLE;
11. Describe the effects of different production systems and land management practices on the hydrologic and water quality response of rural and urban watersheds;
12. Describe the principal components and requirements of a TMDL plan;
13. Describe the advantages and limitations of conventionally used techniques for diffuse pollution control;
14. Understand the impacts of atmospheric pollution on water quality;

15. Design a diffuse pollution control plan for a farm, agricultural watershed, or urban development.

TENTATIVE SCHEDULE

Topic	Week	
Introduction to water quality, legal and regulatory framework for managing NPS pollution: Chapter 1	1	
Causes of diffuse pollution / Basic concepts: Chapters 2-3	2-3	
Hydrology: Chapter 4	4-5	
Erosion and sedimentation: Chapter 5	6-7	
Soil pollution: Chapter 6	8	
Midterm	9	March 18
Groundwater: Chapter 7	10	
Urban and highway diffuse pollution: Chapter 8	11	
Control of urban diffuse pollution: Chapter 9	12	
Agricultural issues: Chapter 10	13	
Aquatic ecosystems and waterbody assessment: Chapter 12	14	
Overview of TMDLs, Modeling, Watershed management and restoration Chapters 11, 13, 14	15	
Final Exam	Wednesday, May 12, 6:20-8:20 pm	

PARTICIPATION/BEHAVIORAL EXPECTATIONS

Please review the [core rules of netiquette](#) for some guidelines and expectations on how to behave in an online learning environment.

COURSE POLICIES (LATE ASSIGNMENTS, MAKE-UP EXAMS, ETC.)



Quizzes: I will endeavor to make this a discussion-oriented course. For this approach to be meaningful and effective, it is essential that you read material as it is assigned prior to our class discussions. To encourage you to do this, I will give several short quizzes throughout the semester to assess whether the reading assignments are being completed and comprehended.

Homework Assignment Format: We will be using Gradescope to submit grades, which is integrated with Canvas. For a student guide to linking with Gradescope, see: <https://help.gradescope.com/article/5d3ifaeqi4-student-canvas>. To ensure that you are presenting your homework solutions in a way that the grader can easily understand and give credit where appropriate, please observe these guidelines:

1. You may type or handwrite neatly (using a pencil or tablet).
2. Use white copy paper or engineering paper (don't use paper with lines on the front as it can make the scan unreadable).
3. Scan and upload your homework ensuring that all problems are legible. If your submitted problems are not clear enough to read, you may not receive credit, so ensure your scan is high quality with the following recommendations:
 - a. Sheet feed PDF scanners in the [Engineering computer labs](#) or library
 - b. Camera phone apps as below, ensuring your page is resting on a flat surface, shooting from straight above. Crop the edges back to those of the paper.
 - i. iPhone or iPhone: Notes app by following these [instructions](#).
 - ii. Android: [Simple Scan app](#)
4. Use only one problem per page, identify the problem number you are working on, and place name, class, and assignment number on each page. Put problem solution pages in order.
5. Box your answer, including units.
6. Showing your work is worth points on the homework.
7. Do not turn in assignments with large portions crossed out or erased.
8. In some cases, showing results in a graph or figure is required. In these cases, label your axes, include units, and make sure solution information is clearly displayed.
9. If you use Excel for assignment calculations, you must document the equations you used in the calculations.

Homework Deadlines: Late homework will be penalized by 20% per 24 hours late, with a maximum late period of 2 days, to ensure rapid posting of homework solutions.

GRADING POLICY



Plus/minus grading will be used with the following weighting:

HOMEWORK	35%
PRESENTATION	5%
MIDTERM	10%
QUIZZES	30%
FINAL EXAM	20%

ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU [Academic Integrity/Misconduct](#) policy as found in the General Catalog and the [Student Conduct Code](#).

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Further information about Academic Integrity is available at [CSU's Academic Integrity - Student Resources](#).

The use of online solution/tutor websites and content are not permitted for the reference or completion of any graded content in this course. The banned solution/tutor websites include, but not limited to, Chegg, NoteHall, Quizlet, Koofers, and other posted textbook solutions. Please reach out to Dr. Bhaskar to discuss if a specific service you are thinking about using for this course is acceptable.

Use of these online solution/tutor websites for the reference or completion of any graded content will be considered receiving unauthorized assistance and, therefore, is cheating and a violation of the CSU Student Conduct Code. Using them may result, at the discretion of the instructor, in a zero for the course, assignment, quiz, or exam. All incidents of this type will be referred to the CSU Student Resolution Center and may be subject to additional University disciplinary action.

INFORMATION ON COVID-19



All students are required to follow public health guidelines in any university space, and are encouraged to continue these practices when off-campus(es). Students also are required to report any COVID-19 symptoms to the university immediately, as well as if they have potentially been exposed or have tested positive at a non-CSU testing location. If you suspect you have symptoms, please fill out the COVID Reporter (<https://covid.colostate.edu/reporter/>). If you have COVID symptoms or know or believe you have been exposed, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you; if you report to your instructor that you will not attend class due to symptoms or a potential exposure, you are required to also submit those concerns through the COVID Reporter. If you do not have access to the internet to fill out the online COVID-19 Reporter, please call (970)491-4600.

If you report symptoms or a positive test, your report is submitted to CSU's Public Health Office. You will receive immediate, initial instructions on what to do and then you will also be contacted by phone by a public health official. Based on your specific circumstances, the public health official may:

- choose to recommend that you be tested and help arrange for a test
- conduct contact tracing
- initiate any necessary public health requirements or recommendations and notify you if you need to take any steps

If you report a potential exposure, the public health official will help you determine if you are at risk of contracting COVID.

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site (<https://covidrecovery.colostate.edu/>).

CANVAS INFORMATION & TECHNICAL SUPPORT

Canvas is the where course content, grades, and communication will reside for this course.

- Login: canvas.colostate.edu
- Support: info.canvas.colostate.edu
- For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#).
 - (970) 491-7276



- help@colostate.edu

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas. If you are new to Canvas quickly review [the Canvas Student Orientation](#) materials.

UNIVERSAL DESIGN FOR LEARNING/ACCOMMODATION OF NEEDS

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due to epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate



documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodations specialist in the SDC.

THIRD-PARTY TOOLS/PRIVACY

Please note that this course may require you to use third-party tools (tools outside of the Canvas learning management system), such as Skype and others. Some of these tools may collect and share information about their users. Because your privacy is important, you are encouraged to consult the privacy policies for any third-party tools in this course so that you are aware of how your personal information is collected, used and shared.

COPYRIGHTED COURSE MATERIALS

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

UNDOCUMENTED STUDENT SUPPORT

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

TITLE IX/INTERPERSONAL VIOLENCE

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Title IX – Sexual Assault, Sexual Violence, Sexual Harassment](#).

If you feel that your rights have been compromised at CSU, several resources are available to assist:



- Student Resolution Center, 200 Lory Student Center, 491-7165
- Office of Equal Opportunity, 101 Student Services, 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the Victim Assistance Team at: 970-492-4242.

RELIGIOUS OBSERVANCES

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending class or completing assigned course work for a religious holiday will need to fill out the [Religious Accommodation Request Form](#) and turn it in to the Division of Student Affairs, located on the second level of the Administration building.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to give to their professor or course instructor.

Students are asked to turn in the request forms as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

CSU PRINCIPLES OF COMMUNITY

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.



Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

DIVERSITY AND INCLUSION

The [Mission, Vision, and Focus](#) webpage of the Vice President for Diversity includes a comprehensive statement of CSU's commitment to diversity and inclusion.