

# Stream Restoration

**BSE 5364**

**Fall 2016**

**Time:** MWF 9:05-9:55 AM; field trips as arranged

**Location:** 105 Seitz Hall

**Instructors:** Dr. Tess Thompson

**Office:** 213 Seitz Hall

**Phone:** 231-2454

**E-mail:** [tthompson@vt.edu](mailto:tthompson@vt.edu)

**Office Hours:** Posted on Canvas and on office door. If you cannot make our office hours, please make an appointment and/or contact us via email.

**Course website:** Check the course website daily for course announcements, updates, and reminders.

**Prerequisites:** Graduate Standing

## Course Materials:

No text is required. Because stream restoration design is a relatively new practice, there are few textbooks. The instructor has developed a list of references for use in the course, which can be downloaded free of charge.

FISRWG. STREAM CORRIDOR RESTORATION: PRINCIPLES, PROCESSES, and PRACTICES. Washington, DC: Federal Interagency Stream Restoration Working Group, GPO Item No. 0120-A, SuDocs No. A 57.6/2:EN3/PT.653, ISBN-0-934213-59-3, 1998, 639.

USDA-NRCS. TITLE 210: ENGINEERING NATIONAL HANDBOOK – PART 654: STREAM RESTORATION DESIGN. Washington, DC: US Department of Agriculture, Natural Resources Conservation Service, 2007, 723.

Harrelson, C.C., Rawlins, C.L., and Potyondy, J.P. STREAM CHANNEL REFERENCE SITES: AN ILLUSTRATED GUIDE TO FIELD TECHNIQUE. General Technical Report RM-245. FortCollins, CO: U.S. Department of Agriculture - Forest Service, Rocky Mountain Forest and Range Experiment Station, 1994, 67.

## Course Description:

This course provides students with a comprehensive background in the stream restoration practice that addresses channel dynamics, sediment transport, impact of human activities on streams, aquatic habitat improvements, and stream restoration design and assessment. Students will learn how to inspect, classify, identify and measure river features. Analyses of channel morphology will be performed to predict river reactions to human activities and watershed change. Students from the natural and social science will be teamed with students from the physical/engineering sciences to develop a comprehensive stream restoration design. The course includes class lectures, readings, field labs and a design project.

## Learning Objectives:

Upon successful completion of this course, students shall be able to:

- Determine stream type, as well as channel dimension, pattern and profile
- Assess underlying cause(s) of channel instabilities
- Describe and apply regime equations, as well as analog and analytical design methods
- Determine stable channel configuration
- Develop a stream restoration design plan as part of a multidisciplinary team
- Explain the US federal 404 permitting process
- Develop a monitoring plan for stream restoration projects

## Course Grading:

Homework will be assigned to reinforce the material covered in class and to help develop a stream restoration design. Assignments will be due one week after they are assigned. The students will also complete a group design project, which will be presented the last week of the semester.

Homework	15%
Annotated bibliographies	20%
Quizzes	20%
Final design project	25%
Participation	10%
Teamwork	10%

## Course Policies

- This is a graduate course and you are expected to participate and be involved. The papers distributed each week should be read and summarized in an annotated bibliography before the following class.
- It is expected that students will not disturb or distract others or in any way interfere with the ability of other students to learn the course material. No laptops, cell phones, or other electronic devices may be in use during the class period unless in a “down” position for note taking, since they are distracting to the instructor and other students. Individuals whose actions create a distraction or disturb other students will be asked to cease the disrupting activity or leave the classroom.
- All assignments are due at the beginning of class, one week after they are assigned, unless otherwise specified by the instructor. Late work will be assessed a penalty of 10% per 24-hr period it is late, up to three days. All work must be neat, complete, and prepared in a professional manner.
- If a student must be absent from class for planned activities (conferences, weddings, etc.), the student must notify the instructor at least one week in advance and must submit any individual assignments in advance of the due date.
- If a student has a temperature greater than 100°C or is experiencing vomiting or diarrhea, they should not come to class, but should email the instructor within 24 hours of the missed class period. Any missed assignments must be submitted within one week of the assignment deadline.

- A student experiencing a serious, but short term, medical problem (such as flu, mono, or brief hospital stay) can request that a letter be sent to the student's academic dean from Schiffert Health Center. The academic dean will then forward this information to the instructors of the student's courses. The student is responsible for then working with the instructor to make up missed work.

**Disability Statement:** Students are encouraged to address any special needs or special accommodations with me during the first two weeks of the semester, or as soon as you become aware of your needs. Those seeking accommodations based on disabilities should obtain a Faculty Letter from the Services for Students with Disabilities office (540-231-0858) located in Lavery Hall, Suite 310) <http://www.ssd.vt.edu/>.

**Honor Code Statement:** The tenets of the Virginia Tech Graduate Honor Code will be strictly enforced in this course, and all assignments shall be subject to the stipulations of the Graduate Honor Code. For more information on the Graduate Honor Code, please refer to the GHS Constitution at <http://ghs.graduateschool.vt.edu>.

**Virginia Tech's Principles of Community:** Virginia Tech is a public land-grant university, committed to teaching and learning, research, and outreach to the Commonwealth of Virginia, the nation, and the world community. Learning from the experiences that shape Virginia Tech as an institution, we acknowledge those aspects of our legacy that reflected bias and exclusion. Therefore, we adopt and practice the following principles as fundamental to our on-going efforts to increase access and inclusion and to create a community that nurtures learning and growth for all of its members:

- We affirm the inherent dignity and value of every person and strive to maintain a climate for work and learning based on mutual respect and understanding.
- We affirm the right of each person to express thoughts and opinions freely. We encourage open expression within a climate of civility, sensitivity, and mutual respect.
- We affirm the value of human diversity because it enriches our lives and the University. We acknowledge and respect our differences while affirming our common humanity.
- We reject all forms of prejudice and discrimination, including those based on age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, and veteran status. We take individual and collective responsibility for helping to eliminate bias and discrimination and for increasing our own understanding of these issues through education, training, and interaction with others.
- We pledge our collective commitment to these principles in the spirit of the Virginia Tech motto of Ut Prosim (That I May Serve).