NRM 88 Course Outline as of Fall 2021

CATALOG INFORMATION

Dept and Nbr: NRM 88 Title: WATRSHD ECOL/RESTORATION
Full Title: Watershed Ecology and Restoration
Last Reviewed: 1/25/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	NRM 280.25

Catalog Description:
An introduction to watershed restoration ecology methods, techniques, and tools used to restore and enhance watershed health.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100 or appropriate placement based on AB705 mandates

Limits on Enrollment:

Schedule of Classes Information:
Description: An introduction to watershed restoration ecology methods, techniques, and tools used to restore and enhance watershed health. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100 or appropriate placement based on AB705 mandates
Limits on Enrollment:
Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2003	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Analyze and explain physical and biological processes of watershed health.
2. Determine the economic need for restoring and maintaining watershed health.
3. Evaluate completed and planned restoration projects and apply prescriptions for repair and sediment reduction.
4. Identify impacts and recommend preventative measures, restoration treatments and Best Management Practices (BMP).

Objectives:
Students will be able to:
1. Define how ecosystems function over space and time, including ecosystem processes and how they vary within a natural window of variability.
2. Discuss physical and biological processes that affect watershed health and function.
3. Identify the biologic and socio-economic need for restoring and maintaining watershed health in California.
4. Identify topographical maps, assessments and hand tools and equipment used by watershed restorationists.
5. Demonstrate an understanding of streambank repair, riparian habitat assessment, and watershed restoration techniques.
6. Compare and contrast local watersheds, and discuss land use impacts (both perceived and real) relative to cause and effect.
7. Evaluate the success of local restoration projects.
8. Analyze and discuss important water issues in California.
9. Familiarity with broad areas of ecological theory that are foundational to the science of restoration ecology.

Topics and Scope:

I. Ecological Theory
   A. Ecosystem function and variability

B. Physical and biological factors influencing watershed health
C. Socio-economic importance of watersheds
D. Principles and practices of restoration ecology

II. Local Watershed Issues in California
A. Overview of local water issues in California: past, present, future
B. Assessment of watershed dynamics
C. Mapping and assessment of local watershed restoration projects

III. Watershed Restoration Ecology
A. Conceptual framework of healthy and impaired watershed processes
B. Watershed impacts and function relative to local and regional and use practices
C. Restoration tool box
D. Sale, timing and cost/benefit
E. Best Management Practices (BMP)
1. Low impact development
2. Slow it, spread it, sink it
3. Rainwater harvesting
4. Water conservation

IV. Restoration Project Planning
A. Fishery restoration techniques, methods, and tools
B. Riparian corridor restoration: planning, appropriate species, location, scheduling
C. Upslope restoration: grasslands, woodlands, wetlands, intermittent streams, erosion control
D. Invasive species: issues and problems related to maintenance of restoration projects

V. Restoration of Aquatic Habitats
A. Identification of land use impacts and innovative solutions for restoring functional processes
B. Recreating riffle-pool-flatwaters, increasing pool volume, spawning and rearing habitat
C. Survey of local restoration techniques, including successes and failures, relative to stream channel function

VI. Riparian Restoration
A. Successful native plant revegetation
B. Methods for controlling invasive species
C. Pierce's Disease and riparian corridors and stream/agricultural interface

Concepts presented in lecture are applied and practiced in lab.

Assignment:

Lecture Related Assignments:
1. Weekly reading assignments (20-30 pages)
2. One to two group oral presentation on land use and impacts on watersheds (15 minutes)
3. One term paper (2-3 pages)
4. One final exam

Lab Related Assignments:
1. Weekly lab activity
2. Two to three lab group projects (e.g. topo maps, sediment measuring techniques)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Term paper	Writing 20 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

None	Problem solving 0 - 0%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab group projects, oral presentation, weekly lab activity	Skill Demonstrations 30 - 40%

Exams: All forms of formal testing, other than skill performance exams.

Final exam	Exams 30 - 40%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
California Salmonid Stream Habitat Restoration Manual. 3rd ed. Flosi, Gray and Downie, Scott and Hopelain, James. State of California, Department of Fish and Game. 1998 (classic)
Stream Corridor Restoration: Principles, Processes & Practices. Federal Stream Interagency Work Group. 1997 (classic)
Instructor prepared materials