

**NRM 86 Course Outline as of Summer 2017****CATALOG INFORMATION**

Dept and Nbr: NRM 86 Title: WATERSHED RES MGMT

Full Title: Watershed Resource Management

Last Reviewed: 1/25/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.50	17.5	Lecture Scheduled	26.25
Minimum	2.00	Lab Scheduled	1.50	6	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 52.50

Total Student Learning Hours: 105.00

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:

**Catalog Description:**

Introduction to the methods and techniques used in measuring, monitoring, and assessing watershed health in North Coast streams. Topics of study include identification of the specific factors limiting ecosystem productivity (vegetation, fish, etc) identification of the critical habitat needs (plants, macroinvertebrates, water quality, etc) and methods for assessing and monitoring watershed resources.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Introduction to the methods and techniques used in measuring, monitoring, and assessing watershed health in North Coast streams. Topics of study include identification of the specific factors limiting ecosystem productivity (vegetation, fish, etc) identification of the critical habitat needs (plants, macroinvertebrates, water quality, etc) and methods for assessing

and monitoring watershed resources. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit: CSU;

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 2002	Inactive:
<b>UC Transfer:</b>		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. Measure, monitor, and assess watershed health in North Coast and other regional streams.
2. Identify and describe specific habitat factors limiting ecosystem productivity.
3. Identify the critical habitat needs and prescribe methods for monitoring and assessing watershed resources.

### **Objectives:**

Upon completion of this courses, students will be able to:

1. Describe habitat inventory procedures.
2. Demonstrate accurate field measurements.
3. Competently operate watershed quality monitoring (turbidity meter, conductivity meter, sechi disk, YSI meter).
4. Organize and assemble accurate watershed survey field notes.
5. Demonstrate accurate field measurements by constructing a stream hydrograph, calculating area and drainage density, and operating flow meters for minimum and maximum flow calculations for streambank and underwater stream condition reports in preparation for watershed restoration projects.
6. Competently operate equipment including: stadia rods for calculating stream depth slopes, hand levels for slope calculations, flow meters for cross sectional stream evaluation, compass for directional information and special densiometer for calculation of canopy and cover density.

### **Topics and Scope:**

- I. Introduction to Watershed Restoration Objectives
  - A. Identification of limiting factors

- B. Field surveys of critical fish habitat needs
- C. Identification of land use impacts
- D. Assessment and monitoring scale, timing and cost considerations
- II. Preliminary Watershed Assessment
  - A. Office equipment, tools, and supplies
  - B. Preparation of watershed overview worksheet
  - C. Use of maps and aerial photos
  - D. Riparian zone and sediment source analysis
  - E. Stream hydrograph preparation and analysis
- III. Watershed Inventory Methods
  - A. Field equipment, tools, and supplies
  - B. Determination of morphological stream features
  - C. Identification of stream channel type
  - D. In-stream habitat assessment
- IV. Fish Sampling Methods
  - A. Species identification and habitat needs
  - B. Tools and supplies
  - C. Streambank/underwater observation form
  - D. Electrofishing, equipment and techniques
- V. Data Summary and Analysis
  - A. "Habitat" data software program
  - B. Stream condition report
  - C. Geographic Information System and stream reach summaries

### Assignment:

1. Reading assignments totaling 150 pages
2. Field assignments using field survey equipment
3. Field survey notebook and forms
4. Group project report of approximately ten pages
5. Final exam

### 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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing  
0 - 0%

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

Field survey notebook and forms.

Problem solving  
25 - 40%

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

Field assignments

Skill Demonstrations  
30 - 50%

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

Final exam: multiple choice, true/false, matching items, completion

Exams  
5 - 15%

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

Group project report

Other Category  
10 - 20%

**Representative Textbooks and Materials:**

California Salmon ID Stream Habitat Restoration Manual: Flosi, Gray, et.al., State of California, Department of Fish and Game, Third Edition, 1998 (Classic)  
Instructor prepared materials