

Discipline: Agriculture	Sub-discipline: Forestry/Natural Resources
General Course Title: Forest Hydrology and Watershed Management	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description:</p> <p>An introduction to forest and wildland hydrology, and the management of resources on a watershed scale including the fundamental concepts of the hydrologic cycle: precipitation, interception, evaporation, evapotranspiration and runoff, infiltration, and groundwater. The fundamentals of protection, management, and monitoring watersheds in California will be emphasized. Laboratory required.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Define the hydrologic cycle and explain the various processes of the cycle. • Construct a stream hydrograph and analyze its various processes of the cycle. • Inventory and appraise various watershed characteristics such as: area, drainage density, relief ration, circularity ration, stream order, etc. • Calculate the average precipitation of a drainage basin using various approaches including: Thiessen polygon method, Isohyetal method, and arithmetic average method. • Recognize and demonstrate runoff and infiltration principles and processes. • Describe the effects of various resource management practices on water yield. • Recognize and discuss important water issues in California. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Introduction to Water Resources in California. <ol style="list-style-type: none"> a. History of water development. b. Regional basis of supply and demand for water. c. Conflicts among the different user groups. d. State, federal and local water projects in California. 2. The Hydrologic Cycle <ol style="list-style-type: none"> a. Physical processes, storage and transport of water. b. Water: physical properties c. Energy exchange and effect on hydrologic functioning. 3. Atmospheric Precipitation. <ol style="list-style-type: none"> a. Types of precipitation: rain, snow, fog. b. Measurement: annual amounts, intensity and seasonal variation. c. Geographic and topographic variation of precipitation. d. Basin precipitation: measurement and analysis. 4. Canopy Interception and Redistribution of Water. <ol style="list-style-type: none"> a. Vegetation canopy characteristics and water storage capacity. b. Canopy throughfall and stemflow. c. Litter interception and potential infiltration. d. Evapotranspiration of water. <p>Forest Hydrology and Watershed Management (Content Continued)</p>	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

5. Infiltration and Runoff.
 - a. Soil characteristics, vegetation disturbance and effect on infiltration rates.
 - b. Surface and subsurface flow of water.
 - c. Measurement of water yield, and stream hydrograph construction and analysis.

6. Measurement of Watershed Characteristics
 - a. Basin area, aspect and topographic relief.
 - b. Stream order, drainage density, and total length of perennial and intermittent streams.
 - c. Streamflow, discharge rates, erosion and sedimentation.

7. Resource Management and Agricultural Activities and Effects on Water Quality and Quantity
 - a. Timber harvesting and log road construction.
 - b. Range management and grazing influences.
 - c. Wildland fire and cumulative management effects.

8. Other Aspects of Watershed Management.
 - a. Flooding and flood control structures.
 - b. Snow hydrology.
 - c. Watershed restoration and rehabilitation.

Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.

Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers	Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams
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Typical Textbooks, Manuals, or Other Support Materials
California Rivers and Streams, The Conflict Between Fluvial Process and Land Use,
 Jeffrey F. Mount. Most recent edition. The University of California Press.

Statewide Articulation: CPSLO-FNR 320, articulated to other universities as specific equivalent by individual community colleges, additional statewide course equivalency articulation currently underway, also currently transfers as lower division elective

FDRG Lead Signature: _____ Date: _____

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