

Colorado AFNR Course Scope and Sequence

Course Name	Colorado Watershed Management		Course Details	Level 4 course in the Natural Resources/Environmental Science Pathway	
			Course = 0.50 Carnegie Unit Credit		
Course Description	A course for students pursuing careers in Natural Resources and Environmental Sciences. This course expands on student learning to the principles of Colorado water and management practices. Students will gain knowledge in career development, leadership, personal development, communications, ecology, Colorado water law, and meteorology.				
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #	18549	Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills					
Unit Number, Title and Brief Description	Suggested % of Instructional Time	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Unit 1: Analyze the different elements in an Ecosystem and the relationship of those interactions in relation to Watersheds	10%	NRS.01. Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	NRS.01.01. Apply methods of classification to examine natural resource availability and ecosystem function in a particular region. ELA: RST.11-12.1 RST.11-12.8 WHST.9-10.2 WHST.11-12.2 WHST.9-10.9 WHST.11-12.9	NRS.01.01.01.a. Summarize and classify the different kinds of natural resources using common classification schemes (e.g., living versus non-living, renewable versus nonrenewable, native versus introduced, etc.). NRS.01.01.02.a. Summarize the components that comprise all ecosystems. NRS.01.01.02.b. Analyze the interdependence of organisms within an ecosystem (e.g., food webs, niches, impact of	

				keystone species, etc.) and assess the dependence of organisms on nonliving components (climate, geography, energy flow, nutrient cycling, etc.). NRS.01.01.02.c. Conduct analyses of ecosystems and document the interactions of living species and non-living resources. NRS.01.01.03.b. Analyze how biodiversity develops through evolution, natural selection and adaptation; explain the importance of biodiversity to ecosystem function and availability of natural resources. NRS.01.01.03.c. Evaluate biodiversity in ecosystems and devise strategies to enhance the function of an ecosystem and the availability of natural resources by increasing the level of biodiversity.	
Unit 2: Understanding the specific ecology concepts and principles of water ecosystems	12%	NRS.01. Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	NRS.01.04. Apply ecological concepts and principles to aquatic natural resource systems. ELA: RST.11-12.1 RST.11-12.7 RST.11-12.8 WHST.9-10.7 WHST.11-12.7 MATH: MA.HS.N.Q.A MA.HS.S.ID.A	NRS.01.04.01.a. Summarize the roles and properties of watersheds. NRS.01.04.01.b. Assess the function of watersheds and their effect on natural resources. NRS.01.04.01.c. Evaluate and defend the importance	

			MA.HS.S.IC.A MA.HS.S.IC.B SCIENCE: SC.HS.3.2	of watersheds to ecosystem function. NRS.01.04.02.a. Examine and describe the importance of groundwater and surface water to natural resources. NRS.01.04.02.b. Analyze how different classifications of ground and surface water affect ecosystem function. NRS.01.04.02.c. Devise and apply strategies to manage, protect, enhance or improve sources of groundwater or surface water based on its properties. NRS.01.04.03.a. Compare and contrast riparian zones and riparian buffers based on their unction. NRS.01.04.03.b. Assess techniques used in the creation, enhancement and management of riparian zones and riparian buffers. NRS.01.04.03.c. Devise and apply strategies for the creation, enhancement and management	
Unit 3: Define the importance of water law and government agencies in	16%	NRS.02. Analyze the interrelationships between natural resources and humans.	NRS.02.01. Examine and interpret the purpose, enforcement, impact and effectiveness of laws and	NRS.02.01.01.a. Distinguish between the types of laws associated	

managing watersheds			agencies related to natural resource management, protection, enhancement and improvement (e.g., water regulations, game laws, historic preservation laws, environmental policy, etc.). NRS.02.03. Analyze how modern perceptions of natural resource management, protection, enhancement and improvement change and develop over time.	with natural resources systems. NRS.02.01.01.b. Analyze the structure of laws associated with natural resources systems. NRS.02.01.01.c. Evaluate the impact of laws associated with natural resources systems (e.g., mitigation, water regulations, carbon emissions, game limits, invasive species, etc.). NRS.02.01.02.a. Distinguish between the types of agencies associated with natural resources systems. NRS.02.01.02.b. Analyze the specific purpose of agencies associated with natural resources systems. NRS.02.01.02.c. Evaluate the impact and effectiveness of agencies associated with natural resources systems (e.g., regulation of consumption, prevention of damage to natural resource systems, management of ecological interactions etc.) NRS.02.03.01.a. Summarize and categorize the different social considerations in regards to	
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				the use of natural resources (e.g., public versus private, laws and regulations, economics, green technology, etc.). NRS.02.03.01.b. Analyze how social considerations can affect the use and sustainability of natural resources.	
Unit 4: Evaluate outdoor recreation impacts on water availability and quality	12%	NRS.02. Analyze the interrelationships between natural resources and humans.	NRS.02.02. Assess the impact of human activities on the availability of natural resources. <u>ELA:</u> <i>RST.11-12.1</i> <i>RST.11-12.2</i> <i>RST.11-12.7</i> <i>RST.11-12.8</i> <i>WHST.9-10.2</i> <i>WHST.11-12.2</i> <i>WHST.9-10.7</i> <i>WHST.11-12.7</i> <u>MATH:</u> <i>MA.HS.N.Q.A</i> <u>SCIENCE:</u> <i>SC.HS.2.6</i> <i>SC.HS.3.9</i> <i>SC.HS.3.11</i> <i>SC.HS.3.12</i>	NRS.02.02.01.a. Summarize the relationship between natural resources, ecosystems and human activity. NRS.02.02.01.b. Assess and explain how different kinds of human activity affect the use and availability of natural resources (i.e. agriculture, industry, transportation, etc.). NRS.02.02.01.c. Evaluate how the availability of natural resources can be improved through changes to human activity. NRS.02.02.03.a. Examine and describe the manner in which modern lifestyles are related to the depletion of natural resources. NRS.02.02.03.b. Identify solutions to improve the	

		NRS.03. Develop plans to ensure sustainable production and processing of natural resources.	NRS.03.01. Sustainably produce, harvest, process and use natural resource products (e.g., forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc.). ELA: RST.11-12.8 SCIENCE: SC.HS.3.9 SC.HS.3.1	sustainability of modern lifestyles. NRS.02.02.03.c. Evaluate how modern lifestyles affect resource consumption and energy use and devise a strategy to prevent the complete loss of a natural resource. NRS.03.01.07.a. Research and summarize how recreational uses of natural resources can be changed to improve sustainability. NRS.03.01.07.b. Assess different options for improving the sustainability of outdoor recreation based on its impact on natural resources and likelihood of acceptance. NRS.03.01.07.c. Evaluate an example of outdoor recreation and develop suggestions for how that activity can be made more sustainable in a manner that is acceptable to those who take part in that activity.	
		NRS.04. Demonstrate responsible management procedures and techniques to protect, maintain, enhance, and improve natural resources.	NRS.04.01. Demonstrate natural resource protection, maintenance, enhancement and improvement techniques. ELA: RST.11-12.8 RW.H2.1.2	NRS.04.01.01.a. Identify and categorize different kinds of streams. NRS.04.01.01.b. Assess and explain indicators of the biological health of a stream. NRS.04.01.01.c.	

			<u>SCIENCE: SC.HS.3.9</u> <u>SC.HS.3.11</u>	Create an enhancement plan for a stream.	
Unit 5: Create a communication plan to promote water conservation	12%	NRS.02. Analyze the interrelationships between natural resources and humans.	NRS.02.05. Communicate information to the public regarding topics related to the management, protection, enhancement, and improvement of natural resources.	NRS.02.05.01.a. Examine and describe ways in which a message regarding natural resources may be communicated to the public through standard media sources (e.g., press, radio, TV, public appearances, etc.). NRS.02.05.01.b. Assess the effectiveness of different methods for communicating natural resource messages. NRS.02.05.01.c. Devise and implement a strategy for communicating a natural resources message through media. NRS.02.05.02.a. Research and summarize how social media and the Internet have changed how people perceive and utilize natural resources (e.g., greater awareness of conservation issues, calls to action, etc.). NRS.02.05.02.b. Assess how to most effectively communicate a message about the conservation, management, enhancement and improvement of natural resources via social media and the Internet.	

				NRS.02.05.02.c. Anticipate and predict how messages about the conservation, management, enhancement and improvement of natural resources will change because of social media and the Internet. NRS.02.05.03.a. Examine and describe how communication can be used to influence behavior, call people to action and instill a sense of civic behavior related to the conservation, management, enhancement and improvement of natural resources. NRS.02.05.03.b. Analyze and summarize examples of how communication can be used to influence behavior, call people to action and instill a sense of civic behavior related to the conservation, management, enhancement and improvement of natural resources. NRS.02.05.03.c. Create a communication plan to influence the behavior of people, call people to action and instill a sense of civic behavior related to the	
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				conservation, management, enhancement and improvement of natural resources.	
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Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources \(Rubrics, integration strategies, etc\)](#)

[CDE Colorado Academic Standards Online \(Online standards lookup tool\)](#)

Standard 1: Oral Expression and Listening

Prepared Graduate 1: *Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.*

Students collaborate to analyze watershed systems, evaluate water resource management practices, investigate watershed health, develop conservation plans, and solve water management challenges through field investigations, data collection, and project-based learning.

Standard 2: Reading for All Purposes

Prepared Graduate 4: *Read a wide range of informational texts to build knowledge and to better understand the human experience.*

Students analyze watershed management plans, Colorado water law resources, hydrology and meteorology data, water quality reports, scientific studies, and conservation policies to understand watershed function and sustainable water resource management.

Prepared Graduate 5: *Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.*

Students develop and apply specialized vocabulary related to watersheds, hydrology, stream systems, water quality, groundwater, water rights, erosion, conservation, meteorology, and ecosystem management to communicate effectively in watershed management settings.

Standard 3: Writing and Composition

Prepared Graduate 6: *Craft arguments using techniques specific to the genre.*

Students evaluate watershed management strategies, water conservation practices, land use decisions, restoration projects, and water policy, defending recommendations using scientific evidence, field observations, and watershed data.

Prepared Graduate 7: *Craft informational/explanatory texts using techniques specific to the genre.*

Students develop watershed management plans, water quality reports, conservation proposals, and technical reports explaining hydrologic processes, watershed health, and sustainable water management practices using scientific evidence.

Standard 4: Research Inquiry and Design

Prepared Graduate 10: *Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.*

Students research watershed processes, Colorado water law, hydrology, meteorology, water quality, ecosystem interactions, conservation strategies, and watershed restoration practices to develop evidence-based plans that protect and improve Colorado's water resources.

Note: *Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.*