Career-Technical Credit Transfer (CT)²
Natural Resource Management Career-Technical Assurance Guide (CTAG)
September 27, 2016

The following courses, indicated by a Career-Technical Articulation Number (CTAN), are eligible for post-secondary credit and transfer among Ohio's public secondary career-technical institutions and state institutions of higher education. The SCTAI alignment document with ODE competencies and postsecondary learning outcomes is available on the ODHE website at https://www.ohiohighered.org/transfer/ct2/ctags.

CTNRM001 - Environmental Science	**Credits: 3 Semester Hours**
Advising Notes: In order to access postsecondary college credit for this CTAN, the student must: • Matriculate to an institution of higher education with an approved or comparable program within 3 years of graduating from an approved career-technical education institution. • Successfully complete ODE secondary course **Environmental Science for Agriculture and Natural Resources (010720)** and earn a qualifying score of ***59 or higher*** on corresponding end-of-course examination.	Secondary institutions must have pathway approval from the Ohio Department of Education. Certificate of Affirmation assurances are now incorporated into the CTE-26 application process.
CTNRM002 Field Botany	**Credits: 3 Semester Hours**
Advising Notes: In order to access postsecondary college credit for this CTAN, the student must: • Matriculate to an institution of higher education with an approved or comparable program within 3 years of graduating from an approved career-technical education institution. • Successfully complete ODE secondary course **Natural Resources (010710)** and earn a qualifying score of ***68 or higher*** on the corresponding end-of-course examination.	Secondary institutions must have pathway approval from the Ohio Department of Education. Certificate of Affirmation assurances are now incorporated into the CTE-26 application process.
CTNRM003 Field Zoology	**Credits: 3 Semester Hours**
Advising Notes: In order to access postsecondary college credit for this CTAN, the student must: • Matriculate to an institution of higher education with an approved or comparable program within 3 years of graduating from an approved career-technical education institution. • Successfully complete ODE secondary course **Wildlife and Fisheries (010745)** and earn a qualifying score of ***65 or higher*** on the corresponding end-of-course examination.	Secondary institutions must have pathway approval from the Ohio Department of Education. Certificate of Affirmation assurances are now incorporated into the CTE-26 application process.

Each CTAN identifies the learning outcomes that are equivalent or common in introductory technical courses. In order for students to receive credit under these agreements, the career-technical programs and the state institutions of higher education must document that their course content matches the learning outcomes in the CTANs.

Requirements and Credit Conditions:

1. The receiving institution must have a comparable program, major, or courses that have been approved through submission to the Ohio Department of Higher Education $(CT)^2$ approval process for the CTANs listed in this document.
2. Credits apply to courses in the specified technical area at Ohio's public institutions of higher education, provided that the institution offers courses in the specific technical area. In the absence of an equivalent course, and when the institution offers the technical program, the receiving institution will guarantee to grant and apply an equivalent credit value of the Career-Technical Articulation Number (CTAN) toward the technical requirements of the specific degree/certificate program.
3. The applicant must provide proof to the receiving institution that they successfully completed a course that has been approved through the $(CT)^2$ approval process and that they earned a qualifying score on the end-of-course examination.
4. A career-technical student seeking credit under the terms of this CTAG must matriculate to an institution of higher education with an approved or comparable program within 3 years of graduating from an approved career-technical education institution.
5. A career-technical student who meets all eligibility criteria will receive the credit hour value for the comparable course(s) as offered at the receiving state institution of higher education.
6. The admission requirements of individual institutions and/or programs are unaffected by the implementation of $(CT)^2$ outcomes.
7. The transfer of credit through this CTAG will not exempt a student from the residency requirements at the receiving institution.
8. Public/State-assisted institutions seeking participation in these statewide articulations must document course equivalency (how learning outcomes are met and measured). Review will be conducted by the Natural Resource Management CTAG Faculty Review Panel. All submissions for approval must be submitted electronically through the Course Equivalency Management System (CEMS).

CTNRM001 – Environmental Science **Credits: 3 Semester Hours**

General Course Description: This is a course for majors and non-majors that introduces current human-caused environmental problems such as air, water and soil pollution, wastes, chemicals and energy resources. Provides an introduction to science, the scientific method, basic biological and ecological concepts and applies these to current environmental issues. Students will investigate how different ecosystems function and respond to changes in various biological, chemical, and geological processes. Both historical and recent examples will be examined to illustrate how human activities impact natural systems and vice versa.

Credits: 3 Semester Hours

Learning Outcomes:

1. *Develop a basic understanding of the scientific method.
2. *Describe the roles of organisms in ecosystems and how populations, communities, and ecosystems change over time.
3. *Explain the cycling of matter and the flow of energy through ecosystems.
4. *Identify the various causes of current environmental issues involved in sustaining the world's human population.
5. *Describe current and historical patterns of energy production and use, and evaluate alternative forms of energy.
6. *Discuss the chief problems of supply, consumption, and pollution of our air, water, soil, and biological resources.
7. *Identify the key policies and legislation associated with environmental protection.

Asterisk Indicates Essential Learning Outcomes

CTNRM002 – Field Botany Credits: 3 Semester Hours

General Course Description: The course provides students with an understanding of plant morphology, physiology, reproduction, metabolism, and the interrelationships between plants and their environment. The student will learn to identify common vascular and nonvascular plants as well as human uses and impacts of a variety of plant species.

Credits: 3 Semester Hours

Learning Outcomes:

1. *Compare and contrast basic plant morphology and physiology.
2. *Identify and describe the diversity and taxonomy of plants.
3. *Identify the impacts of plants on humans and how humans have impacted various plant species.
4. *Observe plant associations in nature and discover the basic principles of phytogeography, ecology, and conservation.
5. *Utilize resources to identify plant species.

Asterisk Indicates Essential Learning Outcomes

CTNRM003 – Field Zoology Credits: 3 Semester Hours

General Course Description: The course will focus on animal identification, morphology, physiology, ecology, biogeography, and systematics of species common to the region, stressing the environmental aspects that affect their distribution. The basic principles of ecology and wildlife management are covered with emphasis on the interrelationships between an animal and its physical and biological surroundings as well as their economic impacts on society.

Credits: 3 Semester Hours

Learning Outcomes:

1. *Identify and utilize the system of invertebrate and vertebrate taxonomy.
2. *Learn the morphological and physiological characteristics of the major animal taxa.
3. *Describe the ecology and behavior of animals.
4. *Comprehend the development of evolutionary and systematic theories, and the impact of fauna on society.
5. *Utilize proper equipment and methods to sample the fauna and analyze and report the data.
6. *Utilize resources to identify local fauna.

Asterisk Indicates Essential Learning Outcomes

Natural Resource Management Pathway Panel Participants
2013-2015

Casey Brooks	Zane State College	SCTAI Lead Panel Expert
Jeff Bates	Columbus State Community College	SCTAI Panel Expert
Kathy Temple-Miller	Hocking College	SCTAI Panel Expert
Dr. Ferenc de Szalay	Kent State University	SCTAI Panel Expert
Dr. John Heywood	The Ohio State University	SCTAI Panel Expert
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Anne Skuce	Ohio Department of Higher Education	Senior Associate Director, SCTAI