



## Ecological Research and Conservation Practicum

<b>Primary Career Cluster:</b>	Energy and Sustainable Resources
<b>Course Contact:</b>	<a href="mailto:CTE.Standards@tn.gov">CTE.Standards@tn.gov</a>
<b>Course Code:</b>	C33H18
<b>Recommended Prerequisite:</b>	Advanced Ecology and Conservation
<b>Credit:</b>	1
<b>Grade Level:</b>	12
<b>Elective Focus-Graduation Requirement:</b>	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Ecological Research and Conservation courses.
<b>Program Of Study (POS) Concentrator:</b>	This course satisfies one out of two required courses to meet the Perkins V concentrator definition when taken in sequence in an approved program of study.
<b>Program of Study Sequence:</b>	This is the fourth course in the <i>Ecological Research and Conservation</i> program of study.
<b>Aligned Student Organization:</b>	Skills USA: <a href="http://www.skillsusatn.org/">http://www.skillsusatn.org/</a>
<b>Coordinating Work-Based Learning (WBL):</b>	Teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit <a href="https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html">https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html</a> .
<b>Tennessee Promoted Student Industry Credentials:</b>	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit <a href="https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html">https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html</a> .
<b>Teacher Endorsement(s):</b>	014, 015, 016, 017, 048, 081, 126, 127, 128, 129, 150, 210, 211, 212, 414, 415, 416, 417, 418, 448, 926, 927, 928, 929, 950
<b>Required Teacher Certification:</b>	None
<b>Required Teacher Training:</b>	None
<b>Teacher Resources:</b>	Best for All Central: <a href="https://bestforall.tnedu.gov/">https://bestforall.tnedu.gov/</a>

## Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st-century skills necessary to be successful in careers and life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards that feed into intentionally designed programs of study.

Students engage in industry-relevant content through general education integration and experiences such as career & technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry-standard content and technology, solve industry-based problems, meaningfully interact with industry professionals, and use/produce industry-specific, informational texts.

### Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course; note this is not an exhaustive list.

- Participate in the CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry-specific skills that involve teamwork and project management.
- Participate in contests highlighting job demonstration, interviewing skills, community service activities, extemporaneous speaking, and job interviews.
- Participate in leadership activities such as the National Leadership and Skills Conference, National Week of Service, and 21st Century Skills.

### Using Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-1.4** | Partner with business and/or industry to conduct field observations.
- **Standards 4.2** | Research conservation principles and strategies. Create a presentation to increase awareness and present to community and educational leaders.
- **Standards 5.1-5.3** | Partner with a local business and/or industry to complete the capstone project. Incorporate feedback to strengthen project plans.
- **Standards 6.1-6.4** | Participate in a mock interview to prepare for a position in the ecology and conservation sector.

## Course Description

*Ecological Research and Conservation Practicum* is the fourth course in the Ecological Research and Conservation program of study. The practicum course offers students hands-on experience in ecology and conservation. Students will apply their knowledge in real-world scenarios, working on projects that involve planning, designing, and implementing ecological and conservation solutions.

## Course Requirements

This capstone course aligns with the requirements of the Work-Based Learning Framework (established in Tennessee State Board High School Policy 2.103), with the Tennessee Department of Education's Work-Based Learning Policy Guide, and with state and federal Child Labor Law. As such, the following components are course requirements.

## Course Standards

### 1. Field Observations and Data Collection in Natural Ecosystems

- 1.1 Conduct Field Studies: Conduct **field studies** by observing and recording **ecological data** in local ecosystems. Identify key environmental variables, assess biodiversity, and monitor ecological processes. Produce a comprehensive report that includes the following components: data collection, ecological observations, data analysis, conclusions, and recommendations.
- 1.2 Participating in Habitat Restoration and Conservation Projects: Engage in **hands-on conservation activities**, including **habitat restoration and environmental stewardship** projects. Research restoration techniques and engage in real-world projects that contribute to the health of local ecosystems.
- 1.3 Monitoring Wildlife Populations and Assessing Species Health: Engage in **monitoring and research activities** aimed at tracking wildlife populations and **assessing species health**. Use field techniques such as camera traps, tracking, and wildlife surveys to gather data on local species. Analyze the data to assess the impacts of environmental factors on species survival.
- 1.4 Applying Ecological Principles to Address Environmental Issues: Apply **ecological principles to address real-world environmental challenges in the community**. Engage in practical conservation projects such as pollution reduction, sustainable land management, or urban greening initiatives. Design and implement projects that promote ecological sustainability and engage the local community.

### 2. Current Research Trends

- 2.1 Current Trends: Research the **latest trends in ecological research** on environmental change and its impact on ecosystems. Explain the most recent advancements in biodiversity, conservation, and restoration ecology.

- 2.2 Innovative Strategies: Investigate **innovative strategies** used to protect endangered species, restore ecosystems, and enhance the ecosystem's resilience in the face of human impacts.

### 3. Project Planning and Engagement

- 3.1 Conservation Project Plan and Implementation Plan: Design and implement a **local conservation project** focused on a specific environmental issue (e.g., invasive species removal, habitat restoration, water conservation). The project presentation will include the following components: project design, implementation, evaluation, and reflection. Present the project to local government officials such as city council members, county commissioners, park district managers, planning commission members, environmental organizations, or local conservation agencies.
- 3.2 Troubleshooting and Maintenance: Diagnose common issues that arise during the conservation project, **applying troubleshooting techniques**. Develop a maintenance schedule and plan for long-term system upkeep.
- 3.3 Safety in Ecology and Conservation: Identify **fundamental principles of safety in the field of ecology and conservation**. Recognize the potential hazards associated with fieldwork and conservation activities and develop skills for identifying, assessing, and mitigating risks to ensure personal and group safety. Describe proper field protocols, safe handling of equipment, and emergency procedures for personal protection and protection of the environment during conservation activities.

### 4. Data Collection and Analysis

- 4.1 Organizing and Managing Ecological Data for Analysis: **Organize and manage ecological data** to ensure its accuracy, consistency, and ease of analysis. Structure data in spreadsheets, create data tables, and organize information in a way that supports future analysis.
- 4.2 Evaluating Conservation Effectiveness Through Data: **Analyze the effectiveness of conservation programs and projects** using ecological data, such as changes in species population, habitat restoration success, and biodiversity recovery.
- 4.3 Using Ecological Data to Propose Conservation Strategies: **Use ecological data to design effective conservation strategies**. Apply data-driven decision-making to address specific environmental challenges, such as habitat loss, environmental change, or invasive species.
- 4.4 Analyzing Ecological Data Using Basic Statistical Techniques: **Apply basic statistical techniques to analyze ecological data** and identify patterns or trends within the data. Use measures of central tendency (mean, median, mode), variability (standard deviation), and correlation to interpret ecological findings.

- 4.5 Statistical Modeling for Conservation Planning: **Apply statistical models** to inform conservation decisions, predict future ecological trends, and **inform conservation planning**. Explain how data can be used to assess environmental risks, monitor the success of conservation projects, and develop strategies for ecosystem management and restoration. Explore how data models can forecast the impacts of human activities, environmental change, and conservation actions.

## 5. Sustainability and Community Impact

- 5.1 Assessing the Environmental and Social Impact of Conservation Projects: Develop the skills to **assess the environmental and social impacts of conservation projects**. Evaluate how conservation initiatives affect local ecosystems, biodiversity, and human communities. Explore key concepts in environmental impact assessments (EIS) and social impact assessments (SIA), including methods for measuring both positive and negative outcomes. Use qualitative and quantitative tools to assess conservation effectiveness and propose improvements based on the findings.
- 5.2 Community Engagement and Education: Collaborate with community leaders, educators, and stakeholders to **promote renewable energy awareness** and adoption.
- 5.3 Long-term Sustainability Planning: Develop strategies for **ensuring the long-term sustainability of conservation projects**, including financial viability, maintenance, and technological updates.

## 6. Capstone Project

- 6.1 Comprehensive Ecology or Conservation Project: Apply knowledge of ecology and conservation in a real-world, work-based learning environment by **planning, executing, and evaluating a comprehensive project focused on ecological research, habitat restoration, biodiversity conservation, or environmental education**. Collaborate with professionals, engage with the community, and contribute to meaningful conservation initiatives.
- 6.2 Presentation of Project Findings and Outcomes: Prepare a **formal presentation of the capstone project**, detailing goals, processes, challenges, and results. Present findings to a panel of instructors, industry experts, or community members, incorporating feedback. Develop multimedia materials, such as posters, videos, or interactive displays, to enhance the presentation.
- 6.3 Reflections: Identify **key lessons learned and areas for growth in both technical and soft skills**. Document reflections in a written report or journal, focusing on the impact of the project on future career aspirations.

## 7. Career Readiness

- 7.1 Resume Building and Interview Preparation: Develop a **professional resume highlighting ecology and conservation skills, projects, and certifications**. Participate in mock interviews with instructors and industry partners to refine communication and presentation skills.
- 7.2 Networking: Explore **opportunities for apprenticeships, internships, and work-based learning in the ecology and conservation sector**.
- 7.3 Education and Career Opportunities in the Ecology and Conservation Sector: Investigate **postsecondary education options**, including degree programs and certifications, in ecology and conservation and related fields.
- 7.4 Portfolio Development: Create a **personal and career portfolio** that illustrates mastery of skills and knowledge in the program of study, such as industry credential attainment, early postsecondary transcripts, work-based learning placements, project completion, etc.

## Standards Alignment Notes

\*References to other standards include:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
  - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.