COURSE OUTLINE: NET255 - ENVIRON. MONITORING

Prepared: Lynn Goulding
Approved: Karen Hudson, Dean, Community Services and Interdisciplinary Studies

Course Code: Title	NET255: ENVIRONMENTAL MONITORING
Program Number: Name	5220: NAT ENVIRONMENT TN
Department:	NATURAL RESOURCES PRG
Academic Year:	2024-2025
Course Description:	This course will provide the student with an understanding of world and regional environmental issues. Ways of detecting, describing and quantifying the effects of pollutants on ecosystems and their components will be studied through field and laboratory analyses. Types and sources of pollution in our water, air and land, monitoring strategies and legislation governing pollution will be discussed.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	NRT254
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**5220 - NAT ENVIRONMENT TN** VLO 1 Collect data from representative biological and environmental samples using routine test procedures. VLO 2 Utilize natural resources equipment and technology to accurately identify ecosystem components for purposes of conserving and managing natural resources. VLO 3 Apply the basic concepts of science to natural resource conservation and management. VLO 4 Conduct natural environment assessments according to standard field survey methods, including the use of appropriate equipment and materials. VLO 7 Work safely in adherence to occupational health and safety standards. VLO 11 Communicate technical information accurately and effectively in oral, written and visual forms. VLO 13 Apply awareness of global environmental issues to conservation and management of natural resources.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 3 Execute mathematical operations accurately.

	EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
General Education Themes:	Science and Technology
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Academic success is directly linked to attendance. Missing more than 1/3 of course hours in a semester shall result in an F Grade for the course.

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Discuss types and sources of pollutants and their effects on ecosystems, their components and associated terminology and ecological relationships.	1.1 Explain key ecological concepts related to energy, biomass, bioaccumulation and bio-magnification. 1.2 Competently perform respiration focused laboratory experiments, including preparation of several test specimens in a variety of closed system environments. 1.3 Record data, and calculate metabolic rates in relation to dissolved oxygen, carbon dioxide and pH. 1.4 Summarize and analyze results in a comprehensive standardized technical report format.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Discuss pollution monitoring with respect to physio-chemical measurements, and toxicology.	2.1 Explain methods of measurement and acceptable parameters for a multitude of physio-chemical features. 2.2 Explain effects of a toxicant, and degree of toxicity to living organisms, and testing limitations. 2.3 Explain the purpose and research required to complete a bioassay. 2.4 Attend research labs where function and capabilities of analyzing equipment and techniques are discussed.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Discuss pollution in regard to bio-monitoring, the biological assessment of water quality, and sampling design.	3.1 Explain how bio-monitoring is performed, sampling theory advantages and disadvantages, and stratification design. 3.2 Collect invertebrates using field sampling equipment and complete a species analysis and invertebrate population estimation. 3.3 Plate preparation and bacterial coliform sample inoculation, plate count and colony survey assessment.

	3.4 Completion of comprehensive reports of experimental findings including discussion of water-borne fecal pollutants.

Course Outcome 4	Learning Objectives for Course Outcome 4
4. Research and perform lab experiments, calculations and reports that explore the impacts of pollution (bioassay, spectrophotometry, etc.) on natural systems and their inhabitants.	4.1 Explain terms and processes of light penetration, eutrophication, annual temperature profiles, and nutrient cycles. 4.2 Explain the impacts of radioactivity, petroleum products, and heavy metals on freshwater systems. 4.4 Undertake field work in winter conditions, perform data collection and proper water sample collection and assessment techniques using field survey equipment. 4.5 Complete a spectrophotometric analysis of phosphorous in soil.

Course Outcome 5	Learning Objectives for Course Outcome 5
5. Discuss climate change including atmospheric pollutants, monitoring methodologies, legal responsibilities and latest trends in pollution.	5.1 Demonstration of air quality monitoring station. 5.2 Discuss atmospheric layers, latest trends in environmental pollution, global warming and climate change. 5.3 Explain legislation pertaining to pollution, roles and responsibilities of compliance. 5.4 Discuss proper sampling procedures.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Exams, Quizzes and participation	45%
Lab Reports and Assignments	55%

Date: July 17, 2024

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.