9/13/2022 DATE

☐ REQUIRED COURSE

☑ ELECTIVE COURSE

MSD DIVISION

☐ NEW COURSE

☑ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	BIO-130		**TITLE:** *(30 Characters Max)*	Environmental Science							
SEM CR HRS:	4	**Lecture:**	3	**Lab:**	2				**ECH:**	5	
Course Level:	☑ Gen Ed / IAI ☐ Career/Technical ☐ Baccalaureate /Non-IAI ☐ Dev Ed/ Not in Degree Audit			**Clinical Practicum:**	0	**Work-based Learning**	0		**WBL ECH:**	**0**	
COURSE PCS #	11 - 26.1305		**IAI Code**	L1 905L				**Contact Hours (Minutes Per Week)**			
Repeatable (Y/N):	N	**Pass/Fail (Y/N):**	N	**Variable Credit (Y/N):**	**N**	**Min:**		**Max:**		**16 Wks**	250	**8 Wks**	500
Prerequisites:	None										
Catalog Description: (40 Word Limit)	This course examines the principles that govern natural environments and human interconnections to them. Some topics include resource use, pollution, sustainability, energy, water, food, ecology, evolution, climate change, and population. Laboratory exercises include outdoor field studies and indoor hands-on exercises										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Unit I - Overview, Resources, Cultural Changes, Worldviews & Sustainability	7	4		
Unit II – Science, Chemistry of Life, Laws of Matter & Energy Applied to Ecosystems, Water Resources: Their Importance to Living Organisms & Ecosystem Impacts of World Water Use	12	8		
Unit III - Food & Energy Resources: Their Importance to Living Organisms and Ecological Impacts	8	8		
Unit IV - Principles and Concepts of Ecology & Evolution & Sustaining Biodiversity	11	8		
Unit V - Population, Air Pollution, Climate Change, Ozone Depletion, Solid & Hazardous Waste: Their Causes and Effects on Living Organisms	7	2		
TOTAL	45	30	0	0

EVALUATION							
QUIZZES	☑	**EXAMS**	☑	**ORAL PRES**	☐	**PAPERS**	☑
LAB WORK	☑	**PROJECTS**	☑	**COMP FINAL**	☑	**OTHER**	☐

COURSE MATERIALS	
TITLE:	Living in the Environment
AUTHOR:	G. Tyler Miller, Jr. and Scott Spoolman
PUBLISHER:	National Geographic Learning/Cengage Learning
VOLUME/EDITION/URL:	19th
COPYRIGHT DATE:	2018

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:
Unit I - Overview, Resources, Cultural Changes, Worldviews & Sustainability		
Ch.1 Introduction, Overview & Cultural Change **Ch. 1 Labs** - Attached	7.5	1. Describe Environmental Science and its goals. 2. Summarize the various types of Earth's resources. 3. Identify the demographic, cultural and economic differences between developing countries and developed countries and how this affects their environmental impacts. 4. Explain cultural changes that have occurred since humans have existed on Earth and how those changes impacted the natural world. 5. Describe the basic causes of environmental problems and their effects on humans and ecosystems.
Ch. 25 Worldviews & Sustainability **Ch. 25** Labs – Attached	3.5	1. Explain the various environmental worldviews; describe one's own worldview. 2. Describe steps needed to make a sustainable society.
Unit II – Science, Chemistry of Life, Laws of Matter & Energy ***Applied to Ecosystems, Water Resources: Their Importance to Living Organisms & Ecosystem Impacts of World Water Us***		

Ch. 2 Science, Matter & Energy **Ch. 2 Lab**s – Attached	9.5	1. Demonstrate critical thinking in the application of the scientific method. 2. Describe matter and energy laws and relate them to ecosystems and human resource use. 3. Explain the forms and types of matter and energy.
Ch. 13 & 20 Water Resources **Ch. 13 & 20 Labs** – Attached	10.5	1. Recognize the importance of water to all living organisms. 2. Describe human influences on water availability and water quality.
Unit III - Food & Energy Resources: Their Importance to Living Organisms and Ecological Impacts		
Ch. 12 Food Resources **Ch. 12 Labs** - Attached	7.5	1. Describe the main types of agriculture and their impact on human health and the environment. 2. Explain the human benefits and environmental impacts of a green revolution. 3. Summarize the world's main food problems and their possible solutions. 4. Recognize the environmental impacts of human food production and propose solutions.
Ch. 15 Non-renewable Energy Resources **Ch. 15 Lab**s - Attached	4.25	1. Describe the fossil fuels and the environmental and human health impacts of their use. 2. Summarize energy production by nuclear reactors.
Ch. 16 Renewable Energy Resources & Energy Efficiency **Ch. 16 Labs** - Attached	4.25	1. Name and describe the various renewable energy resources; explain the environmental, economic, and health benefits and drawbacks of each.
Unit IV - Principles and Concepts of Ecology & Evolution & Sustaining Biodiversity		
Ch. 3,4,5 Ecosystems & How they Work **Ch. 3,4,5 Labs** - Attached	10.5	1. Explain the components of a functional ecosystem. 2. Describe the cycling of matter and flow of energy through an ecosystem. 3. Interpret the dynamics of populations and those factors which influence them. 4. Recognize various types of species interactions. 5. Summarize the biogeochemical cycles. 6. Explain the major biomes and aquatic life zones of earth. 7. Describe how evolution affects biodiversity.
Ch. 10 Sustaining Terrestrial Biodiversity **Ch. 10 Labs** - Attached	5.25	1. Describe the commercial and ecological significance of forests. 2. Explain the current state of forests of the world and how humans have affected them.
Ch. 9 Sustaining Species & Ecosystem Services **Ch. 9 Labs** - Attached	3.25	1. Explain the economic, medical, aesthetic, ecological & ethical significance of wild species. 2. Identify threatened & endangered species; describe the role of conservation biology in protecting species.
Unit V - Population, Air Pollution, Climate Change, Ozone Depletion, Waste Management: Their Causes and Effects on Living Organisms		
Ch. 6 Human Population **Ch. 6 Labs** - Attached	2.5	1. Describe factors affecting human population growth. 2. Compare population growth rate in developed and developing countries. 3. Identify environmental problems associated with the growth of the human population.

Ch. 18 Air Pollution & Ozone **Ch. 18 Labs** - Attached	2.5	1. Describe the main causes and health effects of indoor and outdoor air pollution. 2. Explain the importance of the ozone layer to life on Earth and the causes and effects of ozone destruction in the stratosphere.
Ch. 19 Climate and Climate Change **Ch. 19 Labs** – Attached	2	1. Identify sources of greenhouse gases. 2. Explain possible environmental effects of climate change.
Ch. 21 Solid & Hazardous Waste **Ch. 21 Labs**- Attached	2	1. Summarize the main types of solid and hazardous waste and the strategies for dealing with this waste. 2. Explain the physiological effects of lead, mercury and dioxin on the human body. 3. Describe ways to reduce waste generation.
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COURSE OUTCOMES*	At the successful completion of this course, students will be able to:
	• Identify cultural and worldview changes that have taken place throughout human existence and explain how these changes have impacted the natural world and its resources.
	• Describe the characteristics of a sustainable society and list specific actions that could move our society/economy toward becoming sustainable.
	• Summarize the matter and energy laws and give examples of how they apply to resource use by humans and in functional ecosystems
	• Identify the components of functional ecosystems and explain their importance to the ecosystem and to human life. Explain how biological evolution affects biodiversity. Investigate the reasons for species extinction and propose methods of protecting endangered and threatened species
	• Summarize the environmental and human health effects of current agricultural practices and the use of fossil fuels. Evaluate sustainable alternatives to fossil fuels and unsustainable agricultural practices.
	• Recognize current environmental problems and be able to apply critical thinking in suggesting possible solutions to them. Explain how current environmental problems affect the health of humans and other living organisms.
	• Utilize the scientific method to devise solutions to an environmental problem.

** Course Outcomes will be used in the Assessment Software for Outcomes Assessment. Limit to 3 - 5.*