The Lane GLOBE Program Winter 2019

Science Division & Continuing Education Division

Lane Community College Eugene OR

and

GLOBE is sponsored/supported by

Professional Development opportunities for educators in Lane County
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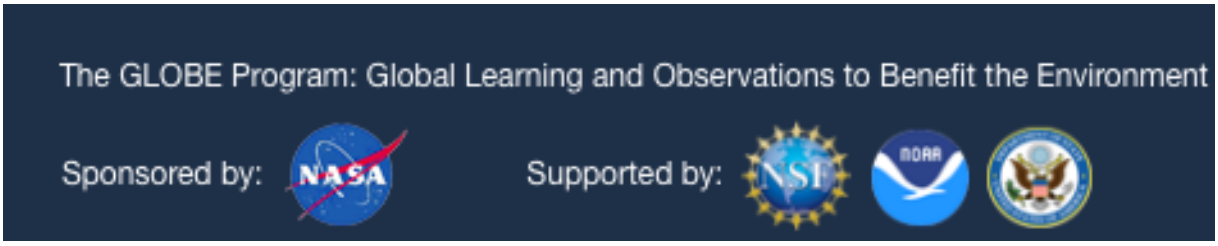
Registration Launches date for classes beginning as soon as 7 January 2019
http://www.lanecc.edu/science/globe-program/



All courses are self-paced and have staggered beginnings, and all will end March 20. Registration is online at http://ce.lanecc.edu/ - you can look for CRNs below or search for GLOBE to get a list of related classes. Registration begins _____.

New courses for Winter 2019

1. GLOBE – Doing and Reporting Atmosphere Observations – Begins January 7 (4 units)

Learn how to deploy atmosphere observations at your school, including some basic atmosphere observations from reporting the sky all the way to using a school-based automated weather station. This short course involves developing at least one school-based observation site and beginning to have GLOBE store and archive your observations for you!

2. GLOBE Pedosphere – An Introduction to Soil Science – Begins January 14 (4 units)

Soils play an integral role in the Earth System. Understanding chemical and physical processes in soil is an integral part of pedology, and helps us to understand our flora and fauna. Whether you are teaching in a garden or a native landscape, soils are an integral part of our exploration.

3. GLOBE Hydrosphere – Water in the Earth System – Begins January 22 (4 units)

Water in the Earth System is often misunderstood, because in part it is so invisible while also being so ever-present! Learn about reservoirs and processes involving water and how we can use a comprehensive approach to measurements of water to understand water cycling, as well as flood and drought, and its relationship to the cryosphere.

4. Measuring water properties – GLOBE Hydrosphere Protocols – Begins February 11 (6 units)

Explore the hydrology protocols in GLOBE including their relationship to macroinvertebrates and mosquitos! GLOBE water quality measurements form an important scientific contribution that is vital, given that many government water quality programs are not operating in many areas. You can find multiple ways to deploy these measurements at or near your school or location!

5. Elementary GLOBE – Earth as a System for Early Science – ***Free!*** 9 Units – Begins February 4

We explore 7 scientific families appropriate for the Elementary Level using this award-winning program from GLOBE. Perfect for educators working with kids from K-5! An introductory GLOBE class is recommended first (also ***free!***).

6. Basic Web-mapping and graphing in GLOBE – Understanding Data – February 18 (4 units)

How do scientists visualize their data? Knowing where we find our data is important, and having the tools to allow us to begin to ask and answer questions requires some good strategies for using mappers and data plotters. Learn more about GLOBE's visualization system and how you might be able to use it at your site or school.

7. GLOBE Data Analysis – more on mapping, graphing, and interpretation – January 28 (4 units)

We'll explore use of GLOBE data to examine atmosphere, hydrosphere, and pedosphere questions posed by you and your students/partners. We'll work on exporting GLOBE data into spreadsheets where appropriate, and learn some basics on data interpretation.

8. Groundwater Analysis – February 18 (4 units)

Although GLOBE does not have a series of measurements on groundwater, which is the world's most important resource for fresh water, we should not ignore it. In the US, the USGS provides great tools to extract information about groundwater and how it has changed. We'll use some of the good materials that USGS has put together to complete our picture of the hydrologic cycle. We'll share some resources we've developed at Lane Community College that you may wish to adapt for your own water labs.

9. NGSS and GLOBE Alignment – February 25 (6 units)

Soils play an integral role in the Earth System. Understanding chemical and physical processes in soil is an integral part of pedology, and helps us to understand our flora and fauna. Whether you are teaching in a garden or a native landscape, soils are an integral part of our exploration.

The classes below were initiated in Fall 2018 and are being repeated Winter 2019
– registration at http://ce.lanecc.edu/ (Continuing Ed)

10. Introduction **to GLOBE. 3 PDU** ***Free!*** **Deploys January 7, 2019**

An online introduction to the GLOBE program, an international science education program focusing on environmental awareness and education (globe.gov on the Internet). Provides access and orientation to resources developed by GLOBE, which in the United States is supported by the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), and National Oceanic and Atmospheric Administration (NOAA). Participants will learn about the importance of measurement protocols in collecting environmental data that will be useful for research and decision-making. Optional on-campus meeting or web collaborative session during late October/early November 2018.

This course, or prior experience in the GLOBE program is required for all remaining units. No registration fee for this course, other than the standard $10 Continuing Education registration fee. Offered every term.

11. Introduction to GLOBE: Atmosphere/Climate. 4 PDU Deploys January 14, 2019

Learn about the GLOBE student investigations that explore the Earth's atmosphere, weather and climate. After completing this module, you will be able to describe the structure and composition of the atmosphere and explain how differential heating of the Earth's surface generates our planet's air circulation patterns. You will be able to identify the atmosphere as one of the interacting components of our Earth system, and become familiar with the Atmosphere Protocols followed by GLOBE students when they collect data for their scientific investigations. Finally, you will explore the steps of setting up a GLOBE Atmosphere study site for and be introduced to GLOBE data reporting and visualization tools. Appropriate for participants in Citizen Science programs. Instruction is completely online using a learning management system, and the GLOBE web site. This course is required in order for participants to be trained in any Atmosphere protocol.

12. Cloudspotting. 4 PDU Deploys January 21

Look up! It's a bird, it's a plane, no, it's … what kind of cloud is that, anyway? This course will train you to become an observer of the sky, and identify and classify cloud types, cloud cover, condensation trails from aircraft (contrails), and contrail cover. We will also examine sky color and brightness, and weather phenomena that may obscure the sky. Participants will have to complete a cloud diary including photographs and learn to use and teach students how to take GLOBE cloud and contrail observations. We will discuss the role that clouds play in surface temperatures and climate. Online access is required from a computer or smart phone. Instruction is completely online using a learning management system, and the GLOBE web site. Participants will learn about Citizen Science opportunities using the new GLOBE Observer App. An optional in-person workshop will be available at Lane's main campus in November. Participants wishing to receive PDU certification will need to enter data into a cloud diary, and may wish to create their first Atmosphere Study Site (an online exercise will help you do this!), in which case observations can be entered directly on the GLOBE web site.

13. Environmental Data Retrieval. 4 PDU. Deploys January 28

This course will provide an introduction and orientation to the data available on the GLOBE web site, particularly well-suited for teachers and informal science educators. Environmental data collected by science agencies across the GLOBE as well as at GLOBE schools can be retrieved, and opportunities to use GLOBE protocols, learning activities, and student research collaborations are all explored in this tutorial. Assessment will include some examples from the mapping and search engines on the web site, and participants will be asked to download sample data. Prerequisite: some knowledge of computer spreadsheets and how they function and their use as aids in data analysis. Instruction is completely online using a learning management system, and the GLOBE web site. Participants will also learn how to gain access to NOAA, NASA, USGS, and EPA collected data.

14. Climate Change for Teachers – 9 PDU – Deploys January 21

Teachers will be introduced to the basic evidence for our changing climate system, including impacts on the atmosphere, hydrosphere, pedosphere (soils), and biosphere. This unit will cover these broad topics:

- Climate Change and Sea Level Rise
- Climate Change and Regional Impacts
- Climate Change and Extreme Weather

- Geospatial Infrastructure for Coastal Communities: Informing Adaptation to Sea Level Rise
- The Climate Literacy Principles
- Climate Change: Fitting the Pieces Together
- Climate Change and NGSS
- Climate Data for Teachers – Where can I find _____ ?
- Introduction to Climatology
- Climate Change Misconceptions

We will use training materials from the UCAR/COMET/MetEd program (http://meted.ucar.edu/), developed by and for professionals who use meteorological and climatological information in their jobs, and we've used these for teachers and introductory audiences successfully for many years. With this course, teachers will enhance their ability to understand and teach the science of climate and climate change. An advanced unit will follow in a subsequent term that will take participants through a workshop that facilitates understanding of climate models, and differences between weather forecasts and climate projections. We will also view and analyze PBS' ***Decoding the Weather Machine*** and other recent science public television programming for its science communication value.

15. Cultural Shift – NGSS in Oregon – Deploys January 28 – 6 PDU

What are the Next Generation Science Standards (NGSS), adopted in 2016 as Oregon's Science Standards? What attributes are particularly applicable to using environmental data in the curriculum? The NGSS are written as ***Performance Expectations***, and involve the interconnected nature in which science is practiced and experienced in the real world. There are three intertwined dimensions in NGSS: *Practices, Core Ideas, and Crosscutting Concepts.* How will teachers embrace the expected cultural shift that is implied here? In this class, we will explore many of the cultural shifts that are expected by Oregon teachers, and see how aspects of the GLOBE program can help with that shift. NGSS provides a guide to 7 Conceptual Shifts, and these are all covered in our class.

1. K-12 Science Education should reflect the interconnected Nature of Science as it is practiced and experienced in the real world.
2. The Next Generation Science Standards are student performance expectations – NOT curriculum.
3. The science concepts build coherently from K-12.
4. The NGSS focus on deeper understanding of content as well as application of content.
5. Science and engineering are integrated in the NGSS from K-12.
6. The NGSS are designed to prepare students for college, career, and citizenship.
7. The NGSS and Common Core State Standards (English, Language Arts, and Mathematics) are aligned.

On tap for Spring 2019 (repeat of Winter 2019 classes + any popular Fall 2018 classes)

1. Intermediate Data Analysis
2. Advanced Data Analysis
3. GLOBE Advanced Atmosphere Observations
4. Introduction to the Biosphere
5. Trees Around the GLOBE – A NASA/GLOBE Partnership
6. The Carbon Cycle (tentative)

Winter 2019 Short-Courses Offered by the Lane GLOBE Program – Full course brochure at http://www.lanecc.edu/science/globe-program/

Science Division • Continuing Education Division • Winter 2019 • Please Register at ce.lanecc.edu by 2/4/2019
Class WWW sites at classes.lanecc.edu beginning January 7, 2019

Course Name	Course Number	CRN	PDU/CEU	Fee	Start Date
GLOBE – Doing and Reporting Atmosphere Observations	XED 9030	33725	4	$10	January 7, 2019
GLOBE Pedosphere – An Introduction to Soil Science	XAG 9840	33726	4	$10	January 14, 2019
GLOBE Hydrosphere – Water in the Earth System	XED 9030	33728	4	$10	January 22, 2019
Measuring Water Properties – GLOBE Hydrosphere	XED 9030	33736	4	$10	February 11, 2019
Elementary GLOBE – Earth as a System	XECE 9944	33734	9	FREE	February 4, 2019
Basic Web-mapping and graphing in GLOBE	XED 9030	33740	4	$10	February 18, 2019
GLOBE Data Analysis	XBT 9715	33731	4	$10	January 28, 2019
Groundwater Analysis	XED 9030	33741	4	$10	February 18, 2019
NGSS and GLOBE Alignment	XED 9030	33743	6	$15	February 25, 2019
Introduction to GLOBE[1]	XED 9030	33724	3	FREE	January 7, 2019
Introduction to GLOBE: Atmosphere/Climate	XED 9030	33727	4	$10	January 14, 2019
Cloudspotting	XED 9030	33729	4	$10	January 22, 2019
Environmental Data Retrieval	XED 9030	33732	4	$10	January 28, 2019
Climate Change for Teachers	XED 9030	33730	9	$20	January 22, 2019
Cultural Shift – NGSS in Oregon	XED 9030	33735	6	$15	February 4, 2019

[1]*Classes that were initiated in Fall 2018, and repeated Winter, are indicated in italics*