

Biophysical Ecology in the Namib Desert: Online Course

COURSE # 001-2-3035 (2 credits)

2022-23 ACADEMIC YEAR – ג' " תשפ

The objective of this course is to teach students who wish to learn how to measure the micrometeorological variables that affect animals and plants in the environments in which they live, and how to analyze the effects of these variables. The course is a combination of online videos and discussions.

Eligible Students: The course and workshop are aimed at graduate students in the life sciences with appropriate backgrounds. Enrollment is limited to 12.

WHAT TO EXPECT IN THE COURSE

Online videos, questions, and discussions: On Tuesday afternoons from 16:00-18:00 Jerusalem time, all participating students from Israel, Namibia, and South Africa will meet on Zoom to view the online videos comprising the course Biophysical Field Methods (BPFM). After viewing together, the week's video lessons, there will be time for questions and discussions. In addition, there will be exercises each week based on the videos shown; these will be discussed in the question-and-answer session of the following week. Students are encouraged to watch the videos on their own before coming to class. Attendance at all meetings of the course is obligatory.

Instructors: Prof. (Emeritus) Berry Pinshow (Mitrani Department of Desert Ecology, Swiss Institute for Dryland Environmental and Energy Research) and Prof. (Emeritus) J. Scott Turner (State University of New York, College of Environmental Science and Forestry).

Full list of lessons and videos attached. We might omit some, due to time constraints

Biophysical Field Methods LIVE 9hr 1min of video content published

Preview



BIOPHYSICAL FIELD METHODS COURSE # 001-2-3035

Curriculum

ACADEMIC YEAR 2022-23

Bulk Uploader

Here's where you add course content—like lectures, course sections, assignments, and more. Click a + icon on the left to get started.

Dismiss

If you're intending to offer your course for free, the total length of video content must be less than 2 hours.

Section 1: Join us in Namibia for a hands-on field exp... **Lecture 1:** Namibia field experience

(Preview enabled)

Section 2: Lesson 1. Energy, temperature and work

✔ Lecture 2: ▶ Introduction to heat and temperature ▼
(Preview enabled)

✔ Lecture 3: ▶ Temperature and heat (Preview enabled) ▼

✔ Lecture 4: ▶ The three laws of thermodynamics ▼
(Preview enabled)

✔ Lecture 5: ▶ Temperature scales ▼

✔ Lecture 6: ▶ Specific heat and thermal capacity ▼

✔ Lecture 7: ▶ Latent heat of vaporization ▼

✔ Lecture 8: ▶ Energy, work and power ▼

✔ Lecture 9: 📄 Judge the poster ▼

✔ Quiz 1: 🔄 Quiz Lesson 1 ▼

Section 3: 📄 Lesson 2. Energy and temperature lifestyles

✔ Lecture 10: ▶ Energy and temperature lifestyles ▼

✔ Lecture 11: ▶ Energy lifestyles ▼

✔ Lecture 12: ▶ The thermal energy budget ▼

✔ Lecture 13: ▶ Temperature life styles ▼

✔ Lecture 14: ▶ Modes of heat exchange
(Preview enabled) ▼

✔ Quiz 2: 🗉 Quiz Lesson 2 ▼

✔ Assignment 1: 📁 Thermal consequence of heat storage

Section 4: 📁 Lesson 3. The operative temperature

✔ Lecture 15: ▶ The operative temperature. Introduction ▼

✔ Lecture 16: ▶ Why operative temperature is not the ... ▼

✔ Lecture 17: ▶ Making a meteorological shelter ▼

✔ Lecture 18: ▶ Size, shape and operative temperature ▼

✔ Lecture 19: ▶ Measuring operative temperature: size...
(Preview enabled) ▼

✔ Lecture 20: ▶ Operative temperature: size and color ... ▼

✔ Lecture 21: ▶ Measuring operative temperature: shape ▼

✔ Assignment 2: 📄 Operative temperature increment

✔ Quiz 3: 🗋 Quiz Lesson 3 ▼

✔ Assignment 3: 📄 How body size affects energy use

✔ Assignment 4: 📄 Calculate an operative temperature

✔ Assignment 5: 📄 How much food does Gulliver requir...

✔ Assignment 6: 📄 The daily march of operative tempe...

✔ Assignment 7: 📄 Experimental comparisons of the o...

Section 5: 📄 Lesson 4. Operative temperature in the re...

✔ Lecture 22: ▶ Operative temperature in the real world ▼

✔ Lecture 23: ▶ Calibration basics



✔ Lecture 24: ▶ Calibration results



✔ Lecture 25: ▶ Microclimates

(Preview enabled)



✔ Lecture 26: ▶ The boundary layer



✔ Lecture 27: ▶ Operative temperature of armored cri...



✔ Lecture 28: ▶ Microenvironments of Welwitschia lea...



✔ Assignment 8: 📄 Behavior and operative temperatur...

Section 6: 📄 Lesson 5. Water

✔ Lecture 29: ▶ Water



✔ Lecture 30: ▶ The colligative properties of water



✔ Lecture 31: ▶ Humidity and vapor phase water



✔ Lecture 32: ▶ Psychrometry

(Preview enabled)



✔ Lecture 33: ▶ Temperature and relative humidity ▼

✔ Quiz 4: ⓘ Lesson 5 Quiz ▼

✔ Quiz 5: ⓘ About water in its different phases ▼

✔ Assignment 9: 📁 Solute concentration and phase ch...

✔ Assignment 10: 📁 Calculate air moisture from the ps...

✔ Assignment 11: 📁 How would you calibrate a Hygroch...

Section 7: 📁 Lesson 6. The water potential

✔ Lecture 34: ▶ The water potential ▼

✔ Lecture 35: ▶ Introduction to the water potential ▼

✔ Lecture 36: ▶ Water potential in soils ▼

✔ Lecture 37: ▶ The Hele-Shaw cell (Preview enabled) ▼

✔ Lecture 38: ▶ Water potential and relative humidity ▼

✔ Lecture 39: ▶ Leaf water potential and the Scholander... ▼

▲ Unpublished Quiz: ? Quiz Lesson 6 ^

Questions

New Question

Preview

Publish

1. Water potential is commonly expressed in units of:
2. Imagine you have a parcel of water that is sitting 2 m above the s...
3. Imagine you have a parcel of water sitting 2 m above a surface. W...
4. Using a Hele-Shaw cell, you observe that a sample of sandy soil d...

✔ Assignment 12: □ Water content and water potential

✔ Assignment 13: □ Estimating matric potential with th...

✔ Assignment 14: □ Water potential of air

Section 8: □ Lesson 7. Water and humidity

✔ Lecture 40: ▶ Water potential and relative humidity i... ▼

✔ Lecture 41: ▶ Humidity and microclimate 1 ▼

✔ Lecture 42: ▶ Humidity and microclimate 2 ▼

✔ Lecture 43: ▶ Analyzing periodic data. The Lissajous... ▼
(Preview enabled)

✔ Lecture 44: ▶ Analyzing periodic data. Fourier analysis ▼

✔ Assignment 15: □ Basics of periodic data

✔ Assignment 16: □ Gain and phase in a Lissajous plot

Section 9: □ Lesson 8. Water and humidity in the real ...

✔ Lecture 45: ▶ Measuring the water potential ▼

✔ Lecture 46: ▶ Water potential around termite mounds ▼

✔ Lecture 47: ▶ Lichens and air-borne water ▼

✔ Lecture 48: ▶ Lichen diversity 1 (Preview enabled) ▼

✔ Lecture 49: ▶ Lichen diversity 2 ▼

Section 10: □ Lesson 9. The transient state

✔ Lecture 50: ▶ The transient state (Preview enabled) ▼

✔ Lecture 51: ▶ Measuring the specific heat ▼

✔ Lecture 52: ▶ Thermal capacity and thermal dampin... ▼

✔ Lecture 53: ▶ The time constant (Preview enabled) ▼

✔ Lecture 54: ▶ The meaning of the time constant ▼

✔ Lecture 55: ▶ The gain ratio and phase ▼

✔ Lecture 56: ▶ How fast must beetles run? ▼

Section 11: ◻ Wrapping it up