Biophysical Ecology in the Namib Desert: Online Course

COURSE # 001-2-3035 (2 credits)

2022-23 ACADEMIC YEAR – תשפ״ג

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

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

Lecture 3: Temperature and heat

Lecture 4: The three laws of thermodynamics

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 lifestyles

### 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
<table>
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<tr>
<th>Lecture 19: Measuring operative temperature: size...</th>
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<tr>
<td>Lecture 20: Operative temperature: size and color...</td>
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<td>Lecture 21: Measuring operative temperature: shape</td>
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<td>Assignment 2: Operative temperature increment</td>
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<td>Quiz 3: Quiz Lesson 3</td>
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<tr>
<td>Assignment 3: How body size affects energy use</td>
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<td>Assignment 4: Calculate an operative temperature</td>
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<td>Assignment 5: How much food does Gulliver requir...</td>
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<td>Assignment 6: The daily march of operative tempe...</td>
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<td>Assignment 7: Experimental comparisons of the o...</td>
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Section 5: Lesson 4. Operative temperature in the re...

<p>| Lecture 22: Operative temperature in the real world |</p>
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<th>Lecture 33:</th>
<th>Temperature and relative humidity</th>
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<tr>
<td>Quiz 4:</td>
<td>Lesson 5 Quiz</td>
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<tr>
<td>Quiz 5:</td>
<td>About water in its different phases</td>
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<td>Assignment 9:</td>
<td>Solute concentration and phase change</td>
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<td>Assignment 10:</td>
<td>Calculate air moisture from the potential</td>
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<td>Assignment 11:</td>
<td>How would you calibrate a Hygroch...</td>
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**Section 7:** Lesson 6. The water potential

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<th>Lecture 34:</th>
<th>The water potential</th>
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<td>Lecture 35:</td>
<td>Introduction to the water potential</td>
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<td>Lecture 36:</td>
<td>Water potential in soils</td>
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<td>Lecture 37:</td>
<td>The Hele-Shaw cell (Preview enabled)</td>
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<tr>
<td>Lecture 38:</td>
<td>Water potential and relative humidity</td>
</tr>
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</table>
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

**Lecture 51:** Measuring the specific heat

**Lecture 52:** Thermal capacity and thermal damping...

**Lecture 53:** The time constant

**Lecture 54:** The meaning of the time constant

**Lecture 55:** The gain ratio and phase

**Lecture 56:** How fast must beetles run?

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**Section 11:** Wrapping it up

**Lecture 58:** What next?

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