

Biology 115D Notes Fall 2023

Dr. Peter Schulze

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- **Unrecognized Numbers and Text Messages**
 - Peter **does not** generally answer *unrecognized* numbers.
 - If you need to reach Dr. Schulze for *urgent* matters, **text** his *cell phone*.
 - In the text message please **include your name**.
- **Office Hours:**
 - **Monday:** 3 PM to 4:30 PM
 - **Wednesday:** 10 AM to 11:30 AM
 - **Thursday:** 2 PM to 3:30 PM
 - **Other Times:** Peter welcomes students at other times **by appointment** or by just stopping by to see if he's available.

Dr. Schulze's Student Learning Objectives for Biol 115

1. **Explain** the *mechanisms* and **key** processes of **evolution** and **natural selection**.
2. **Explain** the *fundamentals* and *importance* of **key** **ecological processes** and **[ecological] phenomena**.
3. **Describe** the *interrelationship* between **long-term** **evolutionary change** and **short-term ecological processes**.
4. **Describe** some ways **humans** *depend on* but *are damaging* **natural** **ecological processes**, *are causing* **extinctions**, and *are interfering* with the **course of evolution**.
5. **Develop** the **skills** of a **scientist**, including *collecting, analyzing, and describing* **data**.

Karsyn's Notes

Wednesday, August 23, 2023

Evolution, Behavior, and Ecology

1. Defining **Evolution**
 1. **Karsyn's** initial definition of **evolution**

The **reaction** of an **organism** or **species** to an **environmental stimulus** **over time**.
 2. **Dr. Schulze's** definition of **evolution**¹

A **change** in the **composition** of a **gene pool**.

- **Gene Pool**: "**All** of the **genes** in a **population** of a **species**," (Schulze 2023).
- **Gene**: "A **unit** of **heredity**," (Schulze 2023).
- **Population**: "A group of members of the **same species** with opportunities to **interbreed**."

2. Defining **Natural Selection**

1. **Karsyn's** initial definition of **natural selection**

The favoring of certain traits over others by the natural environment.

2. **Dr. Schulze's** definition of **natural selection**

Natural, ecological processes that determine which individuals survive and reproduce *according to three circumstances*.

- Three (3) Circumstances that Determine **Natural Selection** that *routinely occur in nature* which lead to the *inevitability* of **natural selection** which in turn results in **evolution**:
 1. *More* [organisms] are born *than the environment can support*.
 2. Individuals are **not identical**.
 3. *Some* variation among individuals is *heritable* ².

3. Karsyn's observations including what she finds confusing or unclear:

Naturally some religious competition in [Karsyn's] eyes.

- Organisms don't always become adapted to the environment because the environment changes too.
- Species go extinct when they can't evolve as fast as the environment changes.

4. Why these topics in the first semester?

- Most schools teach cells and molecular biology in the first semester
 - This foundational knowledge helps students understand everything else.
 - Absent basic understanding of these details students are limited to a large number of disconnected facts.
- The notion of *how* is **evolutionary history**
- There is so much medical insight to be gained by knowing when and why humans evolved to be hunter-gatherers.
 - **Do not** use humans as examples to try understanding the biological process.
 - [Human] culture and ego confuse the student.

5. The **Feynman Technique** [for Learning How to Learn by Teaching Others]

- Write what you know about topic **by hand**.
- Explain to a young person (appropriately).

- Notice what you **cannot** or **did not** explain.
- Follow up, [learn what you could not explain] and then **repeat**.

Friday, August 18, 2023

Chapter 18: Evolution and the Origin of Species

1. Introductory Notes

- All organisms evolved from a different species.
- Evolution is an *ongoing* process.
- Evolution is the rational for all biologic process and drives current curiosity and research.

Chapter 18.1: Understanding Evolution

1. Evolution as a science precedes Darwin
2. The age of the earth is integra in early evolution conventions
3. Galapagos form: Similar organisms on different islands with same distinct differences.
4. Alfred Wallace and Charles Darwin independently thought of natural selection simultaneously.
5. Natural Selection synonymous with survival of the fittest:
 - The more prolific reproduction of individuals with favorable traits that survive environmental change because of those traits.

Footnotes

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1. Dr. Schulze's definition of `evolution` appears on **slide 30** of the **Master Merged Biol 115 PDF**. [↵](#)
 2. Heritability is rooted in genes. [↵](#)