**General Biology 2024**
**Summer Second Session with Dr. Clarissa Dirks; dirksc@evergreen.edu**

This program is intended to help students fulfill General Biology requirements necessary for advanced work in environmental studies and the natural sciences. The content of the program will emphasize evolution as the framework that links the biological sciences across scales—from individual cells, to multi-cellular organisms, up to populations and communities of interacting organisms within ecosystems. We will explore the origins of life on Earth, and the evolution of various branches on the tree of life across geologic time scales. We will incorporate Pacific Northwest natural history to deepen our understanding of evolutionary relationships and focus on the process of science in biology. Students will gain a deeper understanding of cellular and molecular biology, genetics, genomics, gene regulation, biomolecules (lipids, carbohydrates, proteins, and nucleic acids), energetics, metabolic processes, and cellular respiration. Students will also strengthen their understanding of evolution throughout the quarter by applying cellular and molecular biology concepts to the principles of ecology. There will be weekly hands-on laboratory activities and outdoor field exercises that are structured to help your learning.

**Textbooks:**
1) *Biological Science* (6th edition or 7th if the bookstore doesn't support the 6th), by Scott Freeman, Kim Quillin, Lizabeth Allison, Michael Black, Greg Podgorski, and Emily Taylor. Pearson Education, LTD. **ISBN** 978-0-321-97649-9

| **TUESDAY** | **WEDNESDAY** | **THURSDAY** |
|---|---|---|
| 12:00 PM - 3:50 PM | AM: 9:00 – 11:50 AM (laboratory)<br>1:00 PM – 3:50 PM | 10:00AM – 12:50 AM |

- The following weekly topics that will be covered are tentative as we may need to adjust our schedule as the course progresses.
- Back of chapter homework questions underlined and bolded are **due Tuesdays** unless stated otherwise; special homework assignments are listed. Quizzes occur on Thursdays and all assessments are a learning opportunity.
- Labs occur on Wednesday mornings. Lectures and workshops occur during the other meeting times. All sessions are highly interactive!

| DATES & GENERAL TOPICS | READING 5/6th Edition | SPECIFIC TOPICS | TENTATIVE LABS |
|---|---|---|---|
| **WK 1** | • Chapter 25 (review)<br>• Chapters **12, 13** (due wk 2)<br>• Chapter 14 | • Evolution by Natural Selection<br>• Mitosis and Meiosis<br>• Mendelian Genetics | • Lab Safety<br>• Microscopy<br>• Mitosis and Meiosis |
| **WK 2** | • Chapter **23** (due wk 3)<br>• Chapter 24<br>• Chapter 25 | • Evolutionary Processes<br>• Speciation<br>• Phylogenies | • Sterile technique<br>• Making media and solutions,<br>• Pouring plates |
| **WK 2 SPECIAL ASSIGNMENT:** Inside the Cell Back of the Chapter Questions for **Chapter 7 Due Thursday Week 3** | | | |
| **WK 3** | • Chapters **3** (due wk 4)<br>• Chapter 5<br>• Chapter **6** (due wk 4)<br>• Chapter 9 | • Proteins<br>• Lipids<br>• Carbohydrates<br>• Cellular Respiration | • Quadrant Streak<br>• Serial dilutions |
| **WK 4** | • Chapter **4** (due wk 5)<br>• Chapter 16<br>• Chapter 17 | • Nucleic acids<br>• How Genes Work<br>• Transcription and translation | • Restriction digestion<br>• Gel electrophoresis |
| **WK 5** | • Chapter 18<br>• Chapter 19<br>• **One Chapter from 29-36.** Each student will select an organism or virus to research and present. You will be responsible for the associated chapter. | • Bacterial Gene Regulation<br>• Eukaryotic Gene Regulation<br>• The Diversification of Life<br>• Cumulative Group Final as a Review<br>• Research Presentations | • Plant dissection<br>(bring colored pencils!) |
| **WK 5 SPECIAL ASSIGNMENT:** Diversification of Life Research Paper and Associated Chapter **Due Week 5 Thursday at 9 AM** | | | |