**NR 4 –Forest Ecosystems**

**Section # 59087**

**Course Syllabus – Fall 2016**

**Lecture Tues 10:00am – 11:50am FEM 8**

**Lab Tues 1:00pm – 3:50pm FEM 8**

***Instructor:*** Louie Long

Office: FEM 4F, Phone: (559) 638-0300, Ext. 3268

Office Hours: Mon & Wed 2:00pm – 4:00pm, other times by appointment

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***Course Objectives:*** *In the process of completing this course, students will:*

1. Gain an understanding of cellular processes, biological and environmental factors, and how they relate to forest growth and development.
2. Understand the reasoning behind taxonomic and biological organization.
3. Analyze forest communities by collecting data and applying the scientific method.
4. Define populations and communities and understand the dynamics and factors that influence each, including succession and its impact on community structure and function.
5. Understand the response of ecosystems to natural and human-induced disturbances.
6. Recognize ecosystem components and be able to describe their structure and functions.

***Textbook(s):***

Krogh, D. 2014. Biology: A guide to the natural world, custom core edition. Pearson Prentice Hall. Upper Saddle River, New Jersey. Loose leaf **(Optional)**

Lab manual **(Required)**

***Accommodation Statement:***

“If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.”

***Essential Information:***

* It is your responsibility to stay informed on any changes to assignment due dates, readings, test material, etc. Missing a class doesn’t excuse you from this responsibility (i.e. if a due date for an assignment changes, new assignments are given, etc.). This means you should ask a trustworthy classmate for notes if you are absent. Being absent is not an excuse for late work, late assignments, or just not knowing what is happening.
* It is the student’s responsibility to officially withdraw from this and/or any course. Failure to do may result in an “F” grade being awarded. As an instructor, I have the option to drop students who miss more than four class periods.
* Cheating and/or plagiarism will not be tolerated. No credit will be given for an assignment if in the opinion of the instructor the individual has cheated.
* “If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.”
* Please turn cellular phones and pagers off during class time. Sunflower seeds and all tobacco products are **NOT** permitted in the classroom or laboratory setting.

***Field Trips:***

On occasion, we will be conducting labs outside. These labs will be conducted on campus and will be completed by the end of the class period. Always come to lab prepared for outside activities. Prepared is defined as having **sturdy hiking shoes or boot, long pants, water, food, and warm (appropriate) clothing.**

***Participation and Grading Policy:***

Grading for this course is based on the sum of two exams, a comprehensive final, lab assignments, individual participation, and unannounced quizzes. Both lecture and laboratory material will be covered on midterm exams and quizzes. **No early or makeup exams or quizzes will be given**, unless previously (one week) authorized by the instructor. All late assignments will be deducted 15% and must be turned in within one week of due date to receive any credit. Individual participation will be considered when assigning your final grade. Final grades may be curved based on a percentile of the highest point total in the class. Grades will be assigned based on a straight percentage system according to the following scale:

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Grade** | **Cumulative Percent** | **Breakdown of Grades** | **Percentage** |
| A | 90-100 | Lab Assignments | 40% |
| B | 80-89 | Quizzes | 15% |
| C | 70-79 | Midterm Exams X 2 | 30% |
| D | 60-69 | Cumulative Final Exam | 15% |
| F | <59 |  |  |
|  |  | TOTAL | 100% |
|  |  |  |  |

*You can keep track of your grades by logging onto CANVAS from the Reedley College*

*Homepage.*

***LAST DAY TO DROP THE COURSE Friday, October 14th.*** A LETTER GRADE IS ASSIGNED AFTER THIS DATE.

*Topics of Discussion*

1. **The Basics of Life** – We will discuss the chemistry of life starting with the atom and its subatomic particles. You will learn about chemical bonds and the roles that they play not only in life but in the forest. You will also learn the basics of the cell. We will discuss structural differences between plant and animal cells. In nature, nothing happens in a vacuum. Everything relates to something else. In this section we will lay the groundwork for a better understanding of how the forest functions.
2. **Energy in the Forest** – All living things consume energy. It is one of the characteristics of life. In this section we will learn about energy in the forest. What is it? How is it produced? How is it used? You will learn the basics of photosynthesis, where it occurs, and how it produces energy.
3. **Structure & Growth** – A forest is a dynamic ecosystem. Life and death are a constant factor in the forest ecosystem. In this section we will discuss how plant life begins in the forest. We will cover the basics of germination, growth, and form.
4. **Site Factors: Climate** – Many factors play in role in the health of a forest. In this section we will begin the discussion about the four site factors that affect forest productivity by focusing on climate. We will discuss solar radiation and its impact on photosynthesis and well as tree morphology. We will also be introduced to Cellular Respiration.
5. **Site Factors: Forest Soils** – Dirt is what you find under your finger nails, soil is what plants grow in. In this section we will learn the basics of how soil is formed. We will also learn about soil texture and structure and its impact of tree growth.
6. **Site Factors: Biological Factors a.k.a. The Nutrient Cycle** – Soil is what plants grow in but without nutrients, there wouldn’t be much growth. In this section we’ll discuss the nutrients found in forest soils. Are forest soils nutrient rich or nutrient poor? Where do the nutrients come from? How do the nutrients enter the plant? Once nutrients are taken up by a plant, are they lost forever? We’ll answer all of these questions and a few more in this section.
7. **Site Factors: Fire** – For more than a century we’ve been told that fire was bad for our forests. Is this really true? Is it possible that fire is good for a forest? If so, how? In this section we’ll discuss the role that fire platys in the forest ecosystem.
8. **The Soil-Plant Water Cycle** – You probably know or have at least heard of the hydrologic cycle. In this section we will take a more in depth look at the hydrologic cycle. You’ll gain a basic understanding of how energy relates to water and how water moves through the forest. We’ll discuss transpiration, evaporation, and evapotranspiration. We’ll also learn about something called gravitational water, capillary water, and hygroscopic water.

*Tentative Schedule*

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| --- | --- | --- | --- | --- |
| **Week** | **Date** | **Lecture Topic** | **Lab Date** | **Lab Topic** |
| 1 | 8/16/16 | Introduction | 8/16/16 | Lab Orientation |
| 2 | 8/23/16 |  | 8/23/16 | Calculations |
| 3 | 8/30/16 | Quiz 1 | 8/30/16 | Field Observations (outside) |
| 4 | 9/6/16 |  | 9/6/16 | Scientific Writing |
| 5 | 9/13/16 | Quiz 2 | 9/13/16 | Acorn Relative Abundance (outside) |
| 6 | 9/20/16 | **No Class – FCD** | 9/20/16 | **Forest Conservation Days** |
| 7 | 9/27/16 | **Midterm #1** | 9/27/16 | Microscopy |
| 8 | 10/4/16 | Quiz 3 | 10/4/16 | Taxonomic Keys |
| 9 | 10/11/16 |  | 10/11/16 | Leaf Area Index (outside) |
| 10 | 10/18/16 | Quiz 4 | 10/18/16 | Chromatography |
| 11 | 10/25/16 |  | 10/25/16 | Estimating Population Size |
| 12 | 11/1/16 | **Midterm #2** | 11/1/16 | Pattern Analysis |
| 13 | 11/8/16 |  | 11/8/16 | Community Structure (outside) |
| 14 | 11/15/16 | Quiz 5 | 11/15/16 | Transpiration (outside) |
| 15 | 11/22/16 |  | 11/22/16 | Intro to Surveying (outside) |
| 16 | 11/29/16 | Quiz 6 | 11/29/16 | Estimating Water Velocity (outside) |
| 17 | 12/6/16 |  | 12/6/16 | pH Testing |
| 18 | 12/13/16 | **Final Exam 10-1150** |  |  |

*\*Schedule subject to change*