**BIO224-01**

# GENERAL BOTANY

**SUMMER II TERM 2020**

**Lecture**: MW 12:30PM – 1:15PM in Spencer 229; **Lab**: W 2:00-4:00 in Spencer 229
**INSTRUCTOR:** Dr. Krishna Nath
**OFFICE:** Spencer 238; Phone 394-7622 ext 1336/ 2693662870 (in case)
**OFFICE HOURS:** MTWR 9:00-12:00 (on request)
**EMAIL:** knath@uarichmountain.edu

**RESOURCES:**
**Lecture Text:** *Botany: An Introduction to Plant Biology, 6th ed.*; James D. Mauseth. ISBN: 9781284077537
**Laboratory Manual:** *Exercises for the Botany Laboratory, 2nd ed*; Joel A. Kazmierski ISBN: 9781617314087

**MASK POLICY:** As per the Executive order from the governor of Arkansas, all students are required to wear a proper face covering that completely covers the nose and mouth while on campus and in class. Masks with holes or masks that do not completely cover nose and mouth are not acceptable. Any student that does not have a proper mask will leave class and be referred to the Vice Chancellor for Student Affairs for possible disciplinary action.

**FOOD & DRINK:** Food and drinks, including water are not allowed in the classroom at any time.

**COURSE DESCRIPTION**: This course provides a study of plant biology involving aspects of ecology, structure and function, growth, and reproduction of vascular and nonvascular plants. This course also includes botanical terminology, taxonomy, and natural history of the major plant groups. Laboratory is an integral part of this course and participation is required for successful completion of this course. **ACTS Course # BIOL 1034**

**PROGRAM OUTCOME and Rationale:** The purpose of the Associate of Arts Program is to provide students with the knowledge and critical thinking skills that will enable students to analyze problems, arrive at intelligent conclusions, and make reasoned choices in their professional and personal lives.

- Students will demonstrate an understanding of physical and biological principles.
- Students will apply technological and research skills to identify, locate, and process information.
- Students will demonstrate an understanding of the diversity in societies and cultures.

**COURSE OBJECTIVES:** Upon successful completion of Botany, the student should be able to do the following:

- Illustrate the steps of the scientific method including their role in scientific problem solving.
- Apply the use of a light microscope to the observation of botanical specimens and their parts.
- Review the components of a typical cell to their function in the cell.
- Compare the reactions of photosynthesis and cellular respiration including where there occur.
- Differentiate the structure and function of various plant tissue types including the vascular tissues.
- Illustrate the relationship of roots, stems, and leaves of a functional vascular plant.
- Distinguish between mitosis and meiosis.
- Distinguish between the typical life cycle of non-vascular and vascular plants.
- Discuss the reproductive strategies employed by plants.
- Describe the relationship between Mendelian genetics and evolution.

- Define a biological species including how a botanist would present a new species.
- Describe the major plant groups in the current taxonomical system used to classify plants.
- Summarize the relationships that exist between plants and their environment.
- Use references, such as dichotomous keys, to identify unknown plants to genus and species.
- Collect, preserve, mount, and properly label a collection of botanical specimens for presentation.

## LECTURE AND EXAM SCHEDULE

| Topic | Chapter | Unit |
|---|---|---|
| Introduction | 1 | Introduction to Plants and Botany |
| | 2 | Overview of Plant Life |
| Plant Structure | 3 | Cell Structure |
| | 4 | Growth and Division of the Cell |
| **Test 1** | | **2/8/2021 M** |
| Plant Structure | 5 | Tissues and Primary Growth of Stems |
| | 6 | Leaves |
| | 7 | Roots |
| | 8 | Structure of Woody Plants |
| | 9 | Flowers and Reproduction |
| **Test 2** | | **3/8/2021 M** |
| Plant Physiology and Development | 10 | Energy Metabolism: Photosynthesis |
| | 11 | Energy Metabolism: Cellular Respiration |
| | 12 | Transport Processes |
| **Test 3** | | **4/8/2021 M** |
| Genetics and Evolution | 16 | Genetics |
| Genetics and Evolution | 17 | Population Genetics and Evolution |
| **Test 4** | | **4/26/2021 M** |
| | 24 | Ethnobotany: Plants and People |
| Ecology | 25 | Populations and Ecosystems |
| | 27 | Biomes |
| **Comprehensive Final EXAM** | | **5/3M** |

**Disclaimer**: The information contained in this syllabus is as accurate as possible, but may be subject to change with reasonable advance notice. The schedule and content of lectures and assignments may be changed at the discretion of the instructor upon oral notification in class. Changes may involve additions, deletions, substitutions, or changes in sequence or due date.

**(BIO224) General Botany**
**Laboratory Syllabus**
**Spring, 2021**
M 2:00-4:00 in Spencer 229

**Laboratory Outline:** These laboratory activities are tentative. Toward the end of the semester, weather will predict laboratory activities, which is why several may be listed.

| Exercise # | Topics |
|---|---|
| 1 | Microscopes and Plant Cell Structure( Virtual) |
| 2 | Cell Division and Tissue Types ( Virtual) |
| 3 | Stems: Herbaceous plants( Virtual) |
| 4 & Handout | Stems: Woody Plants; First Identification lab( Virtual) |
| 6 | Leaves ( Virtual) |
| 5 & 6 | Roots; Aspects of Classification (pages 62-66) ( Virtual) |
| 14 | Flowering Plants: Flowers ( Virtual) |
| 15 | Flowering Plants: Seeds and Fruits ( Virtual) |
| 13 | Conifers; Issue plant presses; introduction to collection; using dichotomous keys; library resources; Identification Lab ( Virtual) |
| 12 | Ferns / Identification Lab ( Virtual) |
| 10 &11 | Non-vascular and Primitive Vascular Plants / Identification Lab |
| 7 | Algae / Field Trip / Identification Lab ( Virtual) |
| 8 | Fungi / Field Trip / Identification Lab ( Virtual) |
| 9 | Fungi / Field Trip / Identification Lab ( Virtual) |
| | Final Exam, July 27, 2020 |

**COURSE CONDUCT:** Classroom presentation is basically of the lecture-demonstration type. Lecture will be over pre-assigned chapters with powerpoints delivered as a visual aid. This will be supplemented with various scientific models, representative specimens, supplemental handouts, and special projects.

Students should **TAKE NOTES** and are expected to **STUDY** beyond the lab and classroom and manage their time to develop good study habits for this course.

**LABORATORY CONDUCT:** The laboratory consists of a series of hands-on exercises that are designed to reinforce some of the principles covered in lecture. Labs will also introduce the student to some common laboratory equipment and Good Laboratory Practices. Students are expected to follow the instructor's direction and comply with the Rules of the Laboratory. Lab exercises are assigned beforehand and it is expected that you **read the material BEFORE coming to class**. Labs are designed to be investigative and will require critical thinking skills to analyze results of experiments.

**UARM CREDIT HOUR CALCULATOR:** For every course credit hour, you should expect to spend at least three clock hours per week of concentrated attention on course-related work, including but not limited to time attending class, as well as out-of-class time spent reading, reviewing, organizing notes, preparing for upcoming quizzes/exams, problem solving, developing and completing homework, and other activities that enhance learning. For a three hour course, a typical student should expect to spend at least nine hours per week dedicated to the course. This includes the time spent in class.

**COURSE REQUIREMENTS:** Evaluation of student performance in the course will be based on the following:

| | | | |
|---|---|---|---|
| **Test 1-4** : | 4 @ 100 points each | = | 400 points (Test 2 is mid-term) |
| **Final Exam** | 1 @ 100 points | = | 100 points |
| **Homework and quizzes** | 10 @ 10 points each | = | 100 points |
| **Lab activities :** | 10 @ 15 points each | = | 150 points |
| Lab Final Exam: | 1 @ 50 points | = | 50 points |
| **TOTAL POINTS POSSIBLE** | | = | **800 points** |

**Effectively, Lecture is worth 75% of the letter grade and Laboratory the other 25% for this 4 credit hour course.**

GRADING SCALE:

A = 100 - 90%
B = 89 - 80%
C = 79 - 70%
D = 69 - 60%
F = 59% or lower

**EXAMS:** Exam dates are given in the syllabus and students are required to take all the tests offered. Exam questions will be taken from lecture notes, laboratory exercises, discussion, audiovisuals, handouts, textbook and other assignments. Many exam questions will require use of this material and critical thinking to conclude the answer. Exams may include all or any combination of the following types of questions: multiple choice, true/false, short-answer, fill-in-the blank, draw and label, matching, and short answer.

**Comprehensive Final** -Multiple choice questions taken from the semester material.

1. **Everyone must take the comprehensive final, it is not to be dropped.**

**REVIEW QUESTIONS** - ** Each chapter in the textbook has Review Questions in which the answers are covered in lecture and can be found in the book. You are expected to review and answer these questions upon completion of each chapter. These are homework assignments meant to ensure that students are taking notes in class and reading the chapters. To ensure that students are keeping up with the pace, **two bonus points**** will be given for each assignment turned in on time. They are due to be turned in at the beginning of the next class meeting for a total of **10** points a chapter. **Notice that completion of chapters ON TIME add up to extra points!!!**

**LAB activities and QUIZZES** – Approximately 10 lab activities or quizzes will be given throughout the semester during laboratory periods. The quizzes will consist of questions related to laboratory exercises performed, assigned readings, and related lecture information. These quizzes will be administered in class, and in some cases your lab work will be turned in in lieu of the quiz.

**FIELD TRIPS –** Two field trips will be scheduled in the second half of the semester to give students the opportunity to see the diversity of plants we are covering in their native habitat. These field trips may also be used as an opportunity to collect a few plants to add to their collection. Students are expected to dress accordingly, and bring their notebook and collecting supplies. (Transportation will be provided by UARM and trips will be planned to have students back no later than 4:15Pm will be decided on the basis of situation)..

In the replacement of FIELD TRIP, you need to attend the Final Lab exam for this online class.

**PLANT COLLECTION:** A plant collection will be made employing techniques consistent with those utilized by professional botanists in preparation of herbarium specimens. The collection will consist of 40 plants from 30 different families. Points will be awarded according to identification, labeling, quality and curation of the specimens. Requirements and details for the collection will be discussed further and outlined in a handout.

You need to write a technical report on plants species found in Mena, AR.

**ATTENDANCE REQUIREMENTS:** As a student, you are responsible for all material presented during lecture, whether present for the class or not. Assignments are to be completed in a timely fashion; therefore, all make-up work must be completed within 5 calendar days of your return following an absence. Unexcused absences are not to exceed twice what the class meets in a week. Laboratory is a required part of this course and failure to attend or participate **will** result in an "F" for this course. For further information, see "Student Attendance" on page 70 of the 2017/2018 UARM Academic Catalog.

**Make-up Policy:** A student who misses an assignment because of an officially sanctioned college activity or those with a documented excuse for their absence, will be permitted to make up the assignment or test without penalty. Others may also make up missed exams but will be penalized 20% for each occurrence. Any deviation from this policy will be considered on a case-by-case basis.

**Additional Information:** Food and drinks are not permitted in the laboratory. Please make sure that your cell phone and any other electronic devices are turned off (or to a non-sound mode) during the class session. **Place all such devices out on the desktop**.

**Disability Policy:** It is the policy of UARM to accommodate students with disabilities, pursuant to state and federal law. Any student with a disability who needs accommodations should contact the Vice President for Student Affairs Office, 394-7622 ext.1400.

**Arkansas Clean Air Act:** In compliance with the Arkansas Clean Air Act, UARM is a smoke and tobacco free facility. Students are to refrain from the use of all tobacco products while on campus.

**Student Misconduct:** Students committing misconduct are subject to disciplinary sanction(s) and or restrictions. Misconduct or prohibited behavior includes, but is not limited to endangerment, harassment, disruption, sexual misconduct, dishonesty, illegal drugs and/or alcohol, fire or safety issues, gambling, property violations, computer violations or other violations as listed in detail in the UARM catalog.

**Campus Security:** UA Rich Mountain strives to provide a safe learning environment; therefore, students who know of any security risk are asked to contact a college official. For more information follow this link and look under Health and Safety: http://www.uarichmountain.edu/at-a-glance/disclosures

**UA Rich Mountain Mission:** UA Rich Mountain provides transformative education to all learners

# Credit Hour Requirement Calculator

| **Course Information** | | | |
|---|---|---|---|
| Department, Course Number | | Biological Science | BIO224 |
| Course Title | Botany | | |
| Credit Hours | 4 | | |
| Mode of Delivery | Traditional | | Lecture/Lab |
| Weeks in Part of Term | 15 | | |
| Level of Reading Material | Advanced/Scientific/Technical (2) | | 2 |
| Reading Level of Students | Average Student (2) | | 2 |
| Average Pages per Hour | 11 | | |

*Enter either week or term, not both*

| **Contact Hours** | **Hours/Week** | **Hours/Term** | **Total Hours** |
|---|---|---|---|
| Lecture/Recitation | 3 | | 45 |
| Lab Contact Hours | 2 | | 30 |

| **Syllabus Items** | **Pages Asg'd** | **Hours/Week** | **Hours/Term** | |
|---|---|---|---|---|
| Reading Lecture Material | 500 | | 45.5 | 45.5 |
| Review Questions | | | 10 | 10 |
| Reading Lab Assignment | 100 | | 18.2 | 9.1 |
| Plant Collection | | | 12 | 12 |
| Reviewing lecture material for exams | | | 5 | 5 |
| | | | | 0 |
| | | | | 0 |

| | |
|---|---|
| **Total Hours** | 156.6 |
| **Required Hours** | 150 |
| **Difference** | Ok + 6.6 |