# BIOLOGICAL SCIENCE, BIO 1543-Lab01(M) and Lab 02 (W)
**Spring 2021**

**Class Time and Location:** **M** 9:30 AM –12:30 PM, **W** 9:30 AM –12:30 PM; Room # S 229
**Instructor:** Krishna Nath, Ph.D., M.Sc., B.Ed.
**Office and Contact Information:** Room # Spencer 238; Phone 394-7622 ext 1336
**Email:** knath@uarichmountain.edu
**Office Hours:** Posted on the office door

**Resources**:

Laboratory Manual: *Exploring Biology in the Laboratory*, Custom ed; Pendarvis and Crawley.
ISBN-13:9781617313271

**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 fundamental biological concepts including terminology, structure and function, genetics, evolution, classification, processes and characteristics unique to living organisms. It is designed to introduce the principles of biology and will provide the necessary foundation for those desiring additional course work in the field of biology and health sciences. Laboratory is an integral part of this course and participation is required for successful completion of this course. **ACTS COURSE: BIOL1014**

**PROGRAM OUTCOME & 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 competency in writing, reading, speaking, and listening.
- Students will be able to compete academically upon transfer to a four-year institution.

**COURSE OBJECTIVES:** Upon successful completion of Biological Science, the student should be able to:

1. Identify the characteristics of life and the theory that explains the unity and diversity of these characteristics.
2. Utilize the steps of the scientific method in biological problem solving.
3. Describe the relationship between Science and Technology.
4. Competently use a light microscope and computer technology to research biological information.
5. Review the components of a typical cell to their function in the cell.

6. Describe the importance of chemistry and biological molecules to metabolism.
7. Compare the chemical reactions of photosynthesis and cellular respiration including where there occur.
8. Distinguish between mitosis and meiosis including their role in the life cycle.
9. Discuss the role of DNA replication and protein synthesis.
10. Explain the importance of Genetics to the theory of evolution.
11. Define species and describe in a general way the process by which speciation occurs.
12. Describe the typical structure of vascular plant anatomy
13. Identify the different organ systems and their functions in the human body.
14. Define ecology identifying its importance to society.

**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.

Table: Tentative Lab Schedule

| **Week** | **Lab topic and assignment** |
|---|---|
| 1 | Discuss syllabus, pre-test, The Metric System |
| 2 | Microscopy |
| 3 | Cell Structure and Function |
| 4 | Diffusion and Osmosis |
| 5 | Photosynthesis |
| 6 | Cellular Respiration |
| 7 | Cell Division/ Mitosis and Meiosis |
| 8 | The Scientific Method |
| 9 | Basic Mendelian Genetics<br>**Laboratory report due and mid-term** |
| 10 | DNA and the Genetic Code |
| 11 | Evolution |
| 12 | Population Genetics |
| | Ecology |
| 14 | Embryology |
| 15 | Laboratory report due and lab revision if any |
| 16 | **Laboratory report due and final exam** |

**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 (Grading) for Lab**

| | | |
|---|---|---|
| Lab activities and quizzes: | 10 @ 10 points each | = 100 points (lowest will be dropped) |
| Formal Lab Report | 2 @ 20 po351ints | = 40 points |
| Final Exam | 1 @ 50 points | = 60 points |
| **Total points** | | **= 200** |

**GRADING SCALE:**
The final grade for the course will be determined by dividing the student's total number of points earned by the number of possible points. Grades are assigned on the basis of the following percentage scale, after rounding the calculated percentage to the nearest whole number:
Table 2. Grade Scale.

| Percentage | Final Grade |
|---|---|
| 90-100 | A |
| 80- 89 | B |
| 70- 79 | C |
| 60- 69 | D |
| <60 | F |

**Lab Activities:** Tentative dates are given in the syllabus for respective topic. Students are required to attend in each Lab and perform all the lab activities including offered Lab Quizzes and Lab Reports.

**LAB QUIZZES** – Approximately 12 quizzes will be given throughout the semester during laboratory periods and lowest one will be dropped off. 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.

**LABORATORY REPORTS** – Two formal laboratory reports will be submitted during the semester. These will be a summary report over one of the exercises performed in the lab. An outline will be provided when assigned. **Completion of a lab report is a course requirement for successful completion of this course.**

**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.

**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 10% for each occurrence. Any deviation from this policy will be considered on a case-by-case basis.

**Additional Information:** Again, 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 | | BIO1543 |
| Course Title | Biological Science | | | |
| 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/Wee** | **Hours/Term** | **Total Hours** |
| Lecture/Recitation | | 3 | | 45 |
| Lab Contact Hours | | 2 | | 30 |
| | | | | |
| | **Pages Asg'd** | **Hours/Wee** | **Hours/Term** | |
| **Syllabus Items** | | | | |
| Reading Lecture Material | 400 | | 36.4 | 36.4 |
| Learning Outcomes | | | 15 | 15 |
| Reading Lab Assignment | 150 | | 16.4 | 13.6 |
| Preparing Lab Reports | | | 4 | 4 |
| Reviewing lecture material for exams | | | 8 | 8 |
| | | | | 0 |
| | | | | 0 |
| | | | | |
| **Total Hours** | | | | 152 |
| **Required Hours** | | | | 150 |
| **Difference** | | | | Ok + 2 |