# PHYSICAL SCIENCE ONLINE
# PHSC1003 (Lecture IN01) and PHSC1001L (Lab IN01)
Fall 2020

**Class Time and Location**: **Lecture and Lab**: **M, T, W, R** Online Instruction through Moodle.
**Instructor**: Gaumani Gyanwali – Ph. D.: OSU-Stillwater; MS, BS: Tribhuvan University
**Office Location: S244** (Mena Campus)
**Office Hours:** Anytime via email and text messages
**Contact Information:** Office: (479)-394-7622, Ext. 1339
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**Prerequisite**: A grade of "C" or better in Elementary Algebra.

**Resources**:

Textbook: Physical Science, Tenth Edition by Bill W Tillery: McGraw Hill, 2014 ISBN 978-0-07-351389-8.

Laboratory Experiments content and instructions provided on Moodle.

Required Materials:

1. Calculator (any Texas Instruments series), pens, pencils, 1" binder for worksheets and notes.

**Course Description**: This is a general education course designed to meet the need of a laboratory science course for education and other non-science majors. This introductory level course includes the study of selected materials from the fields of chemistry, physics, and astronomy. This course requires at least one paper using a documentation format and multiple lab reports.

**Program Outcomes:** The purpose of the Associates of Arts Program is to provide the student with the knowledge and critical thinking skills that will enable them to analyze problems, arrive at intelligent conclusions, and make reasoned choices in his or her professional and personal life.

- Students will demonstrate an understanding of one-step mathematical calculations and applications.
- Students will demonstrate an understanding of physical and chemical principles.
- Students will apply technological and research skills to identify, locate, and process information.

**Rationale:** In this technological age it is imperative that people have a basic understanding of the technologies they are using in their daily lives. By using a conceptually based hands-on approach, students will quiet their fears of science and gain knowledge and appreciation for this omnipresent discipline.

**Course Objectives:** Upon successful completion of PSC 114, the student should be able to-

1. Recognize the influence of physical science on their daily lives. (Components: apply, validate, and differentiate).

2. Explain the philosophy of science: scientific conclusions are based on experimental evidence. (Components: analyze, evaluate, and interpret data)
3. Perform a scientific experiment, draw proper conclusions, and prepare a formal lab report (Components: collaboration, data collection, calculation and formulation, proper grammar and format, documentation, logical argument, research skills)
4. Demonstrate a basic understanding of measurements, mechanics, sound, heat, electricity, atomic structure, chemical bonding, mole concept, and astronomy by explaining the scientific principles used in everyday items.
5. Develop problem-solving skills for simple mathematical calculations of practical application. (Components: analyze mathematical relationships, calculate, comprehend, and differentiate)

**Topical/Unit Outline:**

I. Scientific Method, Measurement and Error
A. Syteme Internationale
B. Conversion Factors
C. Scientific Notation
D. Precision and Accuracy
E. Percentage Error
II. Force and Motion
A. Motion: Speed, Velocity, Acceleration
B. Forces: Horizontal and Vertical Motion
C. Newton's Three Laws of Motion
D. Motion Due to Gravity
E. Weightlessness
III. Work and Energy
A. Work and Power
B. Energy (Potential and Kinetic)
C. Energy conservation and transfer
D. Energy Sources
E. Renewable energies
IV. Heat and Temperature
A. Temperature/Heat
B. Specific Heat Capacity
C. Heat Transfer
D. Change of Phase
E. Laws of Thermodynamics
F. Heat engines
V. Wave Motion/Sound
A. Waves
B. Reflection and Refraction
C. Interference
D. Doppler Effect
VI. Electricity/Magnetism
A. Static Electricity
B. Circuits
C. Ohm's Law
D. Magnets/Electromagnets
E. Electromagnetic Induction

F. Motors/Generators/Transformers

VII. Atomic Structure

A. Structure of an atom

B. Atomic Spectra

C. Electron Configuration

D. Ions and emission of light

VIII. Periodic Table of Elements

A. Groups and Periods

B. Periodic Properties

C. Chemical Bonding: ionic and covalent compounds

D. Naming binary compounds

IX. Chemical Reactions

A. Molecular formula and weights

B. Chemical equations

C Balancing chemical equations

D. Types of chemical reactions

E. Mole concept

X. Astronomy (The Solar System)

A. Planets, moons, and other bodies

B. Small bodies of the solar system

C. Origin of the solar system

D. Ideas about the solar system

**Tentative Schedule for Lecture/Lab**

| **Week/Date** | **Topics/Chapter/Activity** | **What is due on what day?** |
|---|---|---|
| 8/24 - 8/28 | Chapter 1 Measurement<br>(watch chapter video, study slides, complete chapter 1 worksheet, finish homework 1, perform experiment 1, Prepare lab report 1 and submit) | Worksheet Chapter 1: 8/25 T<br>Homework Chapter 1: 8/26 W<br>Lab Report 1: 8/27 R |
| 8/31 – 9/3 | Chapter 2 Force and Motion<br>(watch chapter video, study slides, complete chapter 2 worksheet, finish homework 2, perform experiment 2, Prepare lab report 2 and submit) | Worksheet Chapter 2: 9/1 T<br>Homework Chapter 2: 9/2 W<br>Lab Report 2: 9/3 R |
| 9/8 – 9/10<br>*(9/7 is Labor day)* | Chapter 3 Work and Energy<br>(watch chapter video, study slides, complete chapter 3 worksheet, finish homework 3, perform experiment 3, Prepare lab report 3 and submit) | Worksheet Chapter 3: 9/8 T<br>Homework Chapter 3: 9/9 W<br>Lab Report 3: 9/10 R |
| 9/14 – 9/17<br>Exam 1 Week | **Study and Review (Chapters 1, 2, 3)**<br>**Exam 1** | **Review: First half of the week (M, T)**<br>**Exam 1: 9/16 W** |
| 9/21 – 9/24 | Chapter 4 Heat and Temperature<br>(watch chapter video, study slides, complete chapter 4 worksheet, finish homework 4, perform experiment 4, Prepare lab report 4 and submit) | Worksheet Chapter 4: 9/22 T<br>Homework Chapter 4: 9/23 W<br>Lab Report 4 : 9/24 R |
| 9/28 – 10/1 | Chapter 5 Wave Motion and Sound<br>(watch chapter video, study slides, complete chapter 5 worksheet, finish | Worksheet Chapter 5: 9/29 T<br>Homework Chapter 5: 9/30 W<br>Lab Report 5 : 10/1 R |

| | | |
|---|---|---|
| | homework 5, perform experiment 5, Prepare lab report 5 and submit) | |
| 10/5 – 10/8 | Chapter 6 Electricity and Magnetism (watch chapter video, study slides, complete chapter 6 worksheet, finish homework 6, perform experiment 6, Prepare lab report 6 and submit) | Worksheet Chapter 6: 10/6 T<br>Homework Chapter 6: 10/7 W<br>Lab Report 6 : 10/8 R |
| 10/12 – 10/15<br>Exam 2 Week | **Study and Review (Chapters 4, 5, 6)**<br>**Exam 2** | **Review: First half of the week (M, T)**<br>**Exam 2: 10/14 W** |
| 10/19 – 10/22 | Chapter 8 Atomic Structure (watch chapter 8 video, study slides, complete chapter worksheet, finish homework 8, perform experiment 8, Prepare lab report 8 and submit) | Worksheet Chapter 8: 10/20 T<br>Homework Chapter 8: 10/21 W<br>Lab Report 7 : 10/22 R |
| 10/26 – 10/29 | Chapter 9 Periodic Table of Elements (watch chapter video, study slides, complete chapter 9 worksheet, finish homework 9, perform experiment 9, Prepare lab report 9 and submit) | Worksheet Chapter 9: 10/27 T<br>Homework Chapter 9: 10/28 W<br>Lab Report 8 : 10/29 R |
| 11/2 – 11/5<br>Exam 3 Week | **Study and Review (Chapters 8, 9)**<br>**Exam 3** | **Review: First half of the week (M, T)**<br>**Exam 3: 11/4 W** |
| 11/9 – 11/12 | Chapter 10 Chemical Reactions (watch chapter video, study slides, complete chapter 10 worksheet, finish homework 10, perform experiment 10, Prepare lab report 10 and submit) | Worksheet Chapter 10: 11/10 T<br>Homework Chapter 10: 11/11 W<br>Lab Report 9 : 11/12 R |
| 11/16 – 11/19 | Chapter 15 Astronomy (watch chapter video, study slides, complete chapter 10 worksheet, finish homework 10, perform experiment 10, Prepare lab report 10 and submit) | Worksheet Chapter 15: 11/17 T<br>Homework Chapter 15: 11/18 W<br>Lab Report 10 : 11/19 R |
| 11/23 – 11/26 | **No exam this week, Wed is holiday** | *Thanksgiving* |
| 11/30 – 12/3<br>Exam 4 Week | **Study and Review (Chapters 10, 15)**<br>**Exam 4** | **Review: First half of the week (M, T)**<br>**Exam 4: 12/2 W** |
| 12/7 Finals | **Final Exam** | **Final exam: 12/9 W** |

**Course Conduct:** The class will be taught using a combination of *Powerpoint* slides and Zoom recorded lectures, solving chapter worksheets, completing assignments and exams on Moodle, and performing laboratory experiments at home and submitting lab reports, also on Moodle platform. Students are strongly encouraged to send emails on any confusion during recorded lectures which can be replayed as many times as needed. It is the student's responsibility to inform the instructor when a concept is confusing or otherwise unclear. Students should answer all the worksheet questions before starting the homework.

Student Support Services (SSS) tutors are available to check the concepts in homework assignments, and exam reviews. You can call or email them for help. In case of extreme difficulty, you must inform the instructor no later than 3 days after the classes started. You cannot pass the course without completing the online Moodle assignments and fully comprehending them.

**UA Rich Mountain Credit Hour Calculator:** For every course credit hour, you should expect to spend at least three clock hours per week of concentrated attention on the course-related work. This is including but not limited to time attending class, as well as out-of-class time spent completing homework, seeking help from instructor or tutors, preparing for upcoming assignments/tests/exam, reviewing material, problem solving, and organizing your notebook. For a four-hour course, a typical student should expect to spend at least twelve hours per week. Please see credit hour calculator attached to end of syllabus.

**Course Requirements/Evaluation (Grading):**

**Lecture (3 credit hours)**

| | |
|---|---|
| Four quarterly tests @100 each | = 300 (lowest one dropped when taken all four) |
| One Final Exam @ 100 | = 100 (cannot be dropped) |
| 10 Online Assignments @ 20 each | = 200 |
| **Total points possible** | **= 600** |

**Lab (1 credit hour)**

| | |
|---|---|
| 10 Lab reports @ 20 each | = 200 |
| **Total points possible** | **= 200** |

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 based on the following percentage scale, after rounding the calculated percentage to the nearest whole number:

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

**Class Procedures/Student Requirements**:

On-Campus Resources: UA Rich Mountain offers assistance to students with quality tutors available in the Student Support Services (SSS).

tutor.com provides 5 hours of free tutoring online for each UA Rich Mountain student per semester. Johnson Learning Commons has contract with this online site where personal tutors are available 24/7. Create an account and get help personally from home or anywhere if internet access is available. Follow the link to log in www.tutor.com/uarichmountain

Attendance Policy: Attendance is based on whether you submit your work or not, if you did not submit the work, you are counted absent for the day or that whole week.

Assignment Due Dates: Must submit the work on time as given in the Tentative Schedule Table above. Late work not possible online.

Extra Credit Opportunity: When you complete the end-of-chapter problems you will be given some extra credit points. Depends on how much you do: more you do, more you get.

**Academic Dishonesty**: It is expected that each student shall do his/her own work on worksheets, homework, exams, lab activity, and lab reports. Cheating, copying other's answers, writing other's statement without citing their reference are all considered plagiarism and are penalized from allowing no point in that particular unit up to dismissal from the whole course, depending on the severity of the offense.

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

**Arkansas Clean Air Act**: In compliance with the Arkansas Clean Air Act, UA Rich Mountain is a smoke and tobacco free facility. Students and guests 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, illegal drugs and/or alcohol, fire or safety issues, gambling, property violations, computer violations or other violations as listed in the UA Rich Mountain catalog.

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

| Credit Hour Requirement Calculator | | | | |
|---|---|---|---|---|
| | | | | |
| **Course Information** | | | | |
| Department, Course Number | PHSC 1003(Lecture) and PHSC1001L(Lab) | | | |
| Course Title | Physical Science | | | |
| Credit Hours | 3 +1 = 4 | | | |
| Mode of Delivery | Traditional | | | |
| 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 | 10 | | | |
| | | | | |
| | | *Enter either week or term, not both* | | |
| **Contact Hours** | | **Hours/Week** | **Hours/Term** | **Total Hours** |
| Lecture/Recitation | | | 45 | 45 |
| Lab Contact Hours | | | 24 | 24 |
| | **Pages Asg'd** | **Hours/Week** | **Hours/Term** | |
| **Syllabus Items** | | | | |
| Reading | 360 | | | 36 |
| Assignment | | 1 | | 15 |
| Online Quiz | | 1 | | 15 |
| Researching Lab questions | | 2 | | 30 |
| Reviewing for exams | | | 10 | 10 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | |
| **Total Hours** | | | | 175 |
| **Required Hours** | | | | 150 |
| **Difference** | | | | Ok + 25 |