Syllabus for LPSC 101—Principles of Physical Science Laboratory 1 Credit Hour Online Learning

I. COURSE DESCRIPTION

Principles of Physical Science Laboratory/PSC 101L is a companion course to Principles of Physical Science Lecture/LPSC 101, which you may have already taken or are presently taking. Both the laboratory and theory courses deal with primary aspects of the sciences of astronomy, physics, and chemistry, as well as fundamental principles of scientific investigation. Corequisite: LPSC 101 Lecture.

II. COURSE GOALS

The purpose of this course is to enable the student to be able to do the following:

- A. Develop problem solving abilities, analysis, and social interaction.
- B. Recognize critical factors in analytical problems and understand the process for solving them.
- C. Working together in a team situation, learning together collaboratively with a lab partner.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

This Principles of Physical Science Laboratory course is designed to give you a firsthand experience in the concepts of scientific research in a practical, low-cost format. Upon completion of the experiments, the students should be able to do the following:

- A. Appreciate God's creation more deeply.
- B. Discover underlying principles by which all scientists investigate their surroundings
- C. Experience and understand the part we play in the delicate balance of our environment, especially because of the critical state we have created in the planet God has given us.
- D. Examine practical environmental issues as stressed through the supplemental readings and environmental exercises.
- E. Design and conduct sound scientific experiments.
- F. Carry out laboratory procedures as presented in each lab report.
- G. Collect data accurately.
- H. Match a given statement with the appropriate term or name.
- I. Use the correct terms and names when writing responses to given questions or when writing general conclusions.
- J. Write a brief conclusion of each lab experiment.
- K. Select from several choices the proper description of a given concept.

- L. Write the mathematical formulation of a given law.
- M. Identify a particular law when expressed by a given mathematical formula.
- N. Answer questions, solve problems, and write brief conclusions as set forth on each lab report.
- O. Answer multiple choice questions as given on each lab report and on the results obtained in performing lab experiments.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

- A. Required Materials
 - 1. Textbooks

All experiments are included in the document "Detailed Description of Experiments" This can be found on the d2l page for the course.

2. Other

A calculator that adds, subtracts multiplies, divides, and takes square roots is sufficient for most calculations in the lab; however, a scientific calculator is preferred.

- B. Optional Materials
 - 1. Textbooks
 - None
 - 2. Other
 - None

V. POLICIES AND PROCEDURES

- A. University Policies and Procedures
 - 1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
 - 2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
 - 3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
 - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
 - b. Failing to meet group assignment or project requirements while claiming to have done so;
 - c. Failing to cite sources used in a paper;
 - d. Creating results for experiments, observations, interviews, or projects that were not done;
 - e. Receiving or giving unauthorized help on assignments.

By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.

- 4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
- 5. Students are to be in compliance with University, school, and departmental policies regarding Whole Person Assessment (WPA) requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
 - a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
 - b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.
- B. Department Policies and Procedures

The experiments are designed to be done with household equipment that you should already have. One item that you may have to purchase is a simple metric scale used to weigh items in grams. Inexpensive dietary or postal scales should be available for less than \$10; however, alternative methods for determining mass have been described should you not be able to locate a scale. You may also need an inexpensive magnetic compass (for elective labs 6 & 11), which you can purchase at a discount store. If you already have an expensive compass, be careful in using it for the magnetism laboratory because the magnet could cause the poles of your compass to reverse.

C. Course Policies and Procedures

To complete each lab assignment, follow these general steps:

- 1. First, read the laboratory in its entirety so you know what you are in for before you begin the observations.
- 2. Locate the necessary equipment you will need. Perform the observation or measurements required.
- 3. Write a laboratory report based on the format presented in \How to Write a Laboratory Report".

This lab report MUST be submitted to the appropriate Drop Box in d2l for you to receive credit for the work. In the lab report, be certain to include the answers to any questions asked in the lab description as well as any graphs or tables of numbers gathered in the exercise.

There are 17 laboratory exercises in the Study Guide under the heading, "Detailed Description of Experiments". Because you are doing these at home and may not have the necessary equipment at hand to do all of them, you must complete only six required exercises and five elective exercises. This is a total of 11 of the 17 exercises in the Table of Contents document.

One of the exercises you complete must be Lab # 8, Acceleration Due to Gravity, which will also involve a special analysis assignment at the end of the course. You should read over all of the assignments first and see if there are any for which you are definitely unable to provide the basic supplies. Please note that the astronomy labs may take several days of observation, especially if the sky gets cloudy. It is recommended that you start these labs soon after you start this course.

A total of 600 points are available in this course. See below for information on how these points are earned.

Evaluation Procedures 1. a.

c.

You will be graded on the 11 laboratory reports you send in, plus the special analysis for Lab #8 (graded as a 12th lab report and included as the WPA artifact) and the final examination. The reports will be evaluated according to neatness, clarity of thought, completeness and to a lesser extent format. The course grade will be determined as follows:

Laboratory Reports (12) 25 points each (300 points total) Final Examination 200 points

- b. A grade will be given on the basis of the accuracy and quality of each assignment. The following scale will be used for the course grade: 90%-100% = A80% - 89% = B
 - 70% 79% = C
 - 60% 69% = D
 - Below 60% = F
 - Whole Person Assessment Requirements In conjunction with lab on Acceleration of Gravity, a special assessment of the results of the exercise is required to be submitted as a WPA artifact. Instructions for completing this assignment are published on d2l website the first day of class. They are also available on the Eli Web site under

the category "Whole Person Assessment" as part of the General Education Handbook.

- 2. Other Policies and/or Procedures
 - No makeup labs are offered. a.
 - Missed classes result in the forfeiture of weekly score points for that b. Week.
 - Lab design: d.
 - (1)The student is expected to study the lab material for each lab before he or she comes to the lab. This advance preparation is necessary because the experimental work must be performed efficiently and with understanding and because the lab quiz will cover both the explanatory material and the experimental work.
 - (2)Students are encouraged to learn how to use their own calculators. A calculator that will add, subtract, multiply, divide, and take square roots will be sufficient for most calculations in the lab. However, a scientific calculator is preferred.

VI. COURSE CALENDAR

To be set on d2l the first day of class. You must perform 11 experiments in total, 2 experiments per week, the six exercises designated by an asterisk (*), and in addition, choose five elective exercises.

Weeks	READ	DO				
Experiments 1-5: Complete the experiments in three weeks.						
	One Demained comparison at and	E Europhy and				
Week 1	One Required experiment and	5 Experiments				
Week 2	Introductions to classmates and					
Week 3	Instructor					
	One Required experiment and one					
	experiment of your choice					
	One Required experiment and one					
	experiment of your choice					
Experiments 6-9: Com	plete the experiments in two weeks.					
Weeks 4-5	- · · · · · · · · · · · · · · · · · · ·	4 Experiments				
	I wo required experiments with written					
	reports;					
	Two experiments of your choice with					
	written reports.					
Experiments 10-11: C	omplete the experiments in two weeks.	1				
Weeks 6-7		2 Experiments				
	Required WPA analysis of acceleration					
	due to gravity lab (week 6)					
	One experiment of your choice.					
	One required experiment.					
	Final Exam Week 7 Friday-Sunday					

Course Inventory for ORU's Student Learning Outcomes LPSC 101—Principles of Physical Science Laboratory Online Learning

This course contributes to the ORU student learning outcomes as indicated below: Significant Contribution – Addresses the outcome directly and includes targeted assessment. Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment. Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment. No Contribution – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities	Significant	Moderate	Minimal	No
	Contribution	Contribution	Contribution	Contribution

1	Outcome #1 – Spiritually Alive Proficiencies/Capacities			
1A	Biblical knowledge		Х	
1B	Sensitivity to the Holy Spirit		Х	
1C	Evangelistic capability			Х
1D	Ethical behavior		Х	

2	Outcome #2 – Intellectually Alert			
	Proficiencies/Capacities			
2A	Critical thinking	Х		
2B	Information literacy		Х	
2C	Global & historical perspectives		Х	
2D	Aesthetic appreciation		Х	
2E	Intellectual creativity		Х	

3	Outcome #3 – Physically Disciplined Proficiencies/Capacities			
3A	Healthy lifestyle		Х	
3B	Physically disciplined lifestyle		Х	

4	Outcome #4 – Socially Adept Proficiencies/Capacities		
4A	Communication skills	Х	
4B	Interpersonal skills	X	
4C	Appreciation of cultural & linguistic differences	Х	
	Responsible citizenship	Х	
4E	Leadership capacity	Х	