

PS126 – Physical Science for Elementary Education

Washburn University
Spring 2008

Instructor: Dr. Brian Thomas Office: Stoffer 210B
Office Hours: M/W 2:00-4:00. Other times by appointment (call or email), or just drop by.
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Instructor's website: <http://www.washburn.edu/faculty/bthomas/>

Instructor: Sue Salem Office Hours: MWF 10-12 noon
Office: Stoffer 312B (my office is open when I'm in it)
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Instructor: Linda Garinger Office Hours: MW 10-12
Office: Stoffer 210D
Phone: 785-670-2147 E-mail: linda.garinger@washburn.edu

REQUIRED TEXTS:

The Physical Universe, 12th Ed., by Krauskopf and Beiser & Laboratory Manual
Course website: MyWashburn:MyCourses (check here for announcements, solutions, etc.)

DESCRIPTION:

The purpose of this course is to give you, as a future elementary educator, a background in the physical sciences. *It is NOT a teaching-methods course* (ie. intended to show you how to teach science), though hopefully some of the methods we use will transfer over for you. Primarily, you should come out of this course with a basic familiarity with the terms, methods and concepts of the sciences of physics, astronomy, and chemistry, as well as the ability to find and understand new information in the physical sciences when it comes time for you to teach it.

It is our intention to make the course as integrated as possible, given the different natures of each of the subjects covered. While different areas of science have a different focus, tools and language, all use the same basic methods and share many common concepts. It is our hope that you will see physical science as an integrated whole with various facets.

Note that there *will* be math involved in this course. Preferably, you will have had some algebra already. If not, you may learn a bit here. All that is strictly required is that you be able to do basic arithmetic, including working with fractions.

You *will* have to put some time and energy into this course. But think of it this way, someday when you wow your own students with the amazing properties of a chemical reaction or how enormous the universe is, it'll be worth the effort. Not to mention the fact that you'll know that much more about the world around you and how science works.

The following goals are applicable to all the areas you'll study and the course in general:

GOALS:

1. Understand what science is, how it works and its limits. Be able to recognize science as a distinct area of human inquiry.
2. Learn and understand the basic concepts and thinking skills used in the physical sciences.
3. Learn how the physical sciences are practiced and how we know what we know.
4. Learn how to seek out and understand new information about scientific problems.

REQUIREMENTS (Physics and Astronomy):

Attendance, In-Class Activities and Daily Quizzes

Class attendance is strongly recommended. A portion of your grade is based on participation in in-class activities. Along with other coursework, these activities are specifically designed to help achieve the course goals and learn the material covered. The in-class activities provide an opportunity for you to engage the material and to interact with your peers and the instructor. Fully participating will help you understand and retain the material and ultimately improve your exam scores.

Activities will be graded on the basis of completion and effort shown. You will be given up to 5 points for each day's activities. There will be no excused absences or make-ups. However, I will drop your 4 lowest activity grades at the end of the semester. Therefore, you effectively have 4 free classes during the physics and astronomy section. Activity sheets you turn in will be returned to aid in your studying. **You are strongly encouraged to get help if you are confused about content covered in activities.**

There will be a quiz every class day, consisting of one question based on the reading for that day. These will be graded and there will be no make-ups. Each quiz will be worth 2 points and you will receive 1 point if you are present to turn in a quiz, even if it is incorrect. I will drop the lowest 4 scores at the end of the semester. The purpose of these quizzes is to encourage you to gain exposure to the material before class.

Reading

You must read the text before each class. There will be a reading quiz daily in physics and astronomy (other sections may vary). I will announce ahead of time what you should be reading. Note that reading a science text is not like reading a novel. You'll need to spend more time and energy and be "active" as you read. That is, take notes, write questions in the margins, work out example problems, etc. You might find it helpful to read a section quickly through and then go back and look more closely at the details. The more exposure you get to material the better you will learn it.

Homework

Homework is an important part of the course as it gives you practice in applying the concepts and skills you learn in class. Homework will be assigned and graded regularly. Homework may not always be graded in detail. I may grade on completion or choose particular parts to focus on. *It is important that you understand the correct answers to homework problems.* Therefore, please ask for help on questions/problems that you are unsure of. Solutions to most homework assignments will be provided to help you in checking your answers.

Your homework **MUST** be well organized, clear, complete, **ON TIME**, and **STAPLED TOGETHER** to receive full credit. ***If I can't read your work, find your answers and work, etc., you won't get credit for it!*** It really is ok to use more than one sheet of paper if necessary. Leave yourself some room, rewrite work if necessary.

Here are some suggestions for how to organize your homework, and what to include:

1. Put your name, the date and the chapter the assignment is from at the top of *each* page. Staple pages together. Please don't use paper clips.
2. Include the problem number, and which part of the problem you are answering.
3. Draw a picture. This will often help you visualize what is going on.
4. Write down known and unknown quantities, if a numerical problem.
5. Write down concepts that apply and equations that express them, if applicable.

6. When working numerical problems, show your work, and **INCLUDE UNITS** (this can help you find mistakes and determine if your answer is correct).
7. Box, circle, or otherwise make clear your final answers (especially on numerical problems) and **INCLUDE UNITS**.

Please note: In *learning* science, the answers aren't the most important part – **how you get the answer is more important**. Therefore, numbers 4-7 are vital.

Exams

In the physics and astronomy section, we will have at least two exams. I will make every attempt to schedule exams so that you will have all of the homework from those chapters graded and returned to use in studying. When needed, you will be allowed to use one sheet (front and back) of equations. No homework problems or other sort of data will be allowed on your sheet unless approved by me. There will be no final exam in the course.

Laboratory

The method of science requires that you experiment in order to figure out how nature behaves. We will have lab once a week. You will be provided with the lab write-up at class time or possibly ahead of time (ie. in your lab book). You must complete the lab and report during the scheduled time period (physics and astronomy, other sections may vary). The report will consist of data that you collect, graphs, analysis, and answers to questions posed in the write-up. You should record data and answers on the write-up and turn it in before you leave the lab, unless otherwise directed.

GRADING:

Grades for the physics and astronomy section will be based on the following:

Midterm exams	60%
Homework	10%
Lab	15%
Participation	10%
Quizzes	5%

REQUIREMENTS (Chemistry):

Tentative Syllabus - Chemistry Portion

Lecturer: Sue Salem

NOTE: YOU DO NOT READ CHEMISTRY, YOU MUST PRACTICE IT!!!!!!!!!!!!!!!!!!!!!!!!!!!!

ASSESSMENTS & LABS: **There will be NO make-up exams, quizzes, or labs!**

If you know you will miss the one exam (Friday, *May 2, 2008*), you may make arrangements to take the exam early. The exam will be worth **100 points** (overall ~30% of the course grade) and will cover both lecture and laboratory work.

Lecture/recitation quizzes will be given after each chapter. Each quiz will be worth **25 points**. (overall ~30% of the course grade) If you know you will miss a quiz, you may make arrangements to take the quiz early.

Each **laboratory report** will be worth **25 points**. Each laboratory will be available *only* on the day listed in the calendar outline below. (overall ~40% of the course grade.) Each lab includes an "Invitation to Inquiry". Each student will complete the Inquiry for each lab. Some inquiries may be done in the Chemistry laboratory after the regularly scheduled lab is completed. Some inquiries are

more practically done at home. *Consult with Salem if you have questions about which is which.*

NOTE: For some of these inquiries, coordination between all students in the class may be necessary . . . **BEFORE** coming to class.

Laboratory participation is required for the successful completion of this course. If you are pregnant or become pregnant during this semester you should consult with your physician to decide if it is advisable for you to continue with this chemistry course. You may obtain a list of chemicals used during labs from your instructor. If you decide to continue, both you and your physician will be required to sign a release of liability form before you will be allowed to continue lab work.

If you are now, or are planning (hoping) to become, pregnant, choosing to take this course at another time is an option you might like to consider.

Pre-lab quizzes will be given before each lab (hence the name!). Each will be worth **5 points out of the 25 point total for each lab.**

15 points extra credit is available for anyone who provides three outstanding chemistry links and explains why they are outstanding. (**5 points each**) OR **15 points extra** credit will be given for perfect attendance.

HOMEWORK:

It is important that you work assigned problems and make an effort to understand them. These problems are for learning and practice purposes. Answers not listed in the book will be posted under “Files” on the Course Homepage shell around our class. If there are concepts you do not understand after reading the book, participating in lecture, recitation, and the laboratory, please ask questions in lecture/recitation sections. You are probably not the only person who is confused. My door is always open to the concerned student during the office hours below.

LAB POLICY:

Please note: Attendance during lab times is required to receive credit. The lab is scheduled from 1:40 to 4:30 on Friday afternoons. If you have conflicts during this time, you need to resolve them *immediately*. No makeup labs will be allowed in any section of the course. However, your lowest lab score in each section (physics & astronomy and chemistry) will be dropped in figuring your final grade. That is, you may miss one lab in each section. Please note, however, that just like all other coursework, labs will contain important material that will appear on exams.

OVERALL GRADING SCALE:

You will receive a grade in each subject area and these will be combined to give your final grade for the course. Grades for each part of the course will be weighted according to the amount of time spent in class.

Weighting:

Physics & Astronomy	40%
Chemistry	40%
Poster Project	15%
Topic Notebook	5%

Overall Grade Ranges:

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

OVERALL SCHEDULE:

Physics & Astronomy:	January 23 – March 14
Chemistry:	March 24 – May 2
Final Poster Prep (<i>no class</i>):	May 5 & 7
Poster Presentation:	May 9 (last day of classes)

CELL PHONES

Cell phones *may not* be used in class. Period. Turn your phone off before coming to class if you think this will be a problem for you.

Select Mission of the University:

Washburn University shall prepare qualified individuals for careers, further study and life long learning through excellence in teaching and scholarly work. Washburn University shall make a special effort to help individuals reach their full academic potential. *Washburn University Board of Regents, 1999*

Academic Misconduct Policy:

All students are expected to conduct themselves appropriately and ethically in their academic work. Inappropriate and unethical behavior includes (but is not limited to) giving or receiving unauthorized aid on examinations or in the preparation of papers or other assignments, or knowingly misrepresenting the source of academic work. Washburn University's Academic Impropriety Policy describes academically unethical behavior in greater detail and explains the actions that may be taken when such behavior occurs. For guidelines regarding protection of copyright, consult www.washburn.edu/copyright/students. For a complete copy of the Academic Impropriety Policy, contact the office of the Vice President for Academic Affairs, Morgan 262, or go on-line to: www.washburn.edu/admin/vpaa/fachdbk/FHsec7.html#VIII

Disability Services:

The Student Services Office is responsible for assisting in arranging accommodations and for identifying resources on campus for persons with disabilities. Qualified students with disabilities must register with the office to be eligible for services. The office **MUST** have appropriate documentation on file in order to provide services. Accommodations may include in-class note takers, test readers and/or scribes, adaptive computer technology, brailled materials. Requests for accommodations should be submitted at least two months before services should begin; however, if you need an accommodation this semester, please contact the Student Services Office immediately.

Location: Student Services, Morgan Hall Room 150

Phone: 785-670-1629 or TDD 785-670-1025

E-Mail: student-services@washburn.edu

Students may voluntarily identify themselves to the instructor for a referral to the Student Services Office.

Center for Undergraduate Studies and Programs (CUSP):

As a Washburn student, you may experience difficulty with issues such as studying, personal problems, time management, or choice of major, classes, or employment. The Center for Undergraduate Studies and Programs (Office of Academic Advising, Educational Opportunity Program, and Office of Career Counseling, Testing and Assessment) is available to help students either directly through academic advising, mentoring, career counseling, testing and developing learning strategies or by identifying the appropriate University resource. If you feel you need someone with whom to discuss an issue confidentially and free of charge, contact CUSP in Morgan 122, 785-670-1299, advising@washburn.edu.

Withdrawal Policy:

During fall and spring semesters, students may withdraw from full semester courses through the second week of class with no recorded grade. From the third through the eleventh week a “W” is recorded for any dropped course. Beginning with the start of the twelfth week, there are NO withdrawals, and a grade will be assigned for the course. For short-term or summer course deadlines, please check the appropriate Semester/Session Course Bulletin Web Site (www.washburn.edu/schedule)

Official E-Mail Address:

Your Washburn University e-mail address will be the official address used by the University for relaying important messages regarding academic and financial information and the University will consider this your official notification for important information. **It may also be used by your instructors to provide specific course information.** If you prefer to use an alternate e-mail address to receive official University notices, you can access your MyWashburn e-mail account, choose the "Options" tab, and select "Settings", scroll to the bottom of the screen and enter the e-mail address you would like your Washburn emails forwarded to in the “mail forwarding” area. Click on save changes. This will complete the process of forwarding your Washburn e-mail. It is your responsibility to ensure that your official e-mail box does not exceed your message quota resulting in the inability of e-mail messages to be accepted into your mailbox.

Chemistry Schedule:

Date	Lecture/Recitation	Homework	Laboratory
Mar. 24 – Apr. 4	Introduction to Chemistry Begin Chapter 9	All Multiple Choice and all Exercises in Chapter 9 – pace yourself!	
March 26			Lab Safety Video
Mar. 28			Pre-Lab 28 Quiz Safety Scavenger Hunt Lab 28 – Physical & Chemical
Apr. 4			Pre-Lab 35 Quiz Lab 35 – Identifying Salts
Apr. 7	Quiz – Chapter 9		
Apr. 7 – Apr. 11	Chapter 10	All Multiple Choice and all Exercises in Chapter 10 – pace yourself!	
Apr. 11			Pre-Lab 32 Quiz Lab 32 – Percent Composition
Apr. 14	Quiz – Chapter 10		
Apr. 14 – Apr. 18	Chapter 11	All Multiple Choice and all Exercises in Chapter 11 – pace yourself!	Pre-Lab 38 Quiz Lab 38 - pH
Apr. 21	Quiz – Chapter 11		
Apr. 21 – Apr. 25	Chapter 12	All Multiple Choice and all Exercises in Chapter 12 – pace yourself!	Pre-Lab 34 Quiz Lab 34 – Salts by Neutralization
Apr. 28 – Apr. 30	Review		
May 2	Chemistry Final Exam		