

PHY376 – Introduction to Nuclear Science

Fall 2017 - Syllabus

ver 9/6/17

Lecture meets in Cowley 103 on **MW 9:55a-10:50a**

Instructor: **Dr. Rob Salgado**, Cowley 116

Office Hours: M 3:20-4:10p, Tu 12:35-1:25p, W 11:00a-11:50a

or, by appointment, or drop by my office [my schedule will also be posted there]

Email: rsalgado@uwlax.edu (the best way to reach me)

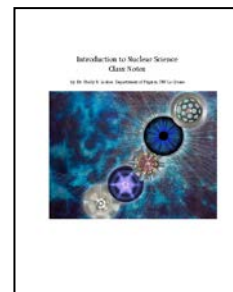
sent from *your* uwlax.edu email account, with **376** included in the subject line

Required Materials:

- **Leshner, *Introduction to Nuclear Science: Class Notes***
This will be distributed in printed form.
- **Cutnell & Johnson, *Physics*** (10e by David Young & Shane Stadler).
We will use this book for background reading and practice problems.
You can find this book in textbook rental.
- A **scientific calculator** will be needed for homework problems, for quizzes and examinations, and for the lab. Please label the calculator with your name.
(Note: The use of smartphones, laptops, tablets, etc... is NOT PERMITTED during exams.)
- **D2L**: I will maintain a D2L website that links to announcements, homework assignments and solutions, electronic-whiteboard notes, and handouts. Consult D2L frequently.
(These materials are not a substitute for regular attendance, participation, and problem-solving. The whiteboard notes are a substantial but incomplete record of what was discussed and done during class. They should supplement—not replace—your own notes. Generally, they will be posted within 24 hours after the class meeting. Revised versions may be posted in response to any errors brought to my attention.)



**for
exams**



Course Description (based on catalog):

(PHY 376 Cr.3) ***Introduction to Nuclear Science***—An introduction to the structure and properties of atomic nuclei. This course will explore the production of ionizing radiation, its interactions with matter, and the instrumentation used to detect it. While all types of ionizing radiation will be studied, particular emphasis will be placed on X- and gamma-rays. Special topics related to the use of radiation in health care also will be covered. Prerequisite: MTH 150; one year of general physics or general chemistry.

Learning Objectives:

This class is part of the UWL vision to cultivate knowledge, skills, and habits of mind essential for independent learning and thinking.

When you complete this class, you will be able to:

- construct or use models to analyze, explain, or predict phenomena,
- identify and use methods of inquiry appropriate to solve physics problems,
- use mathematical and logical methods to solve problems (in physics, and in other subjects!)
- gain a general understanding of basic nuclear physics through learning about nuclear stability, types of radiation, the interactions of radiation with matter, and the detection of radiation
- be acquainted with the fundamentals of radiation protection
- learn how to use certain radiation detectors for medical purposes

Responsibilities:

Please read the entire syllabus carefully. You are responsible for all of the requirements and procedures described here and for all announcements, assignments, changes, etc., whether or not you are in class.

As an instructor, my responsibility is to find ways to help you learn how to solve physics problems. This class is likely NOT like your high-school physics or other university science classes. Physics is not “a set of facts that need to be memorized”; it is a way of applying a few basic rules [principles of physics] in a

variety of situations. Your responsibility is to be an engaged learner; you must actively participate in class and work to develop your problem-solving skills (and, yes, that means even outside of class).

Concerns or Complaints:

If you have a concern or a complaint about the course, or me, I encourage you to bring that to my attention. My hope would be that by communicating your concern we would be able to come to a resolution. If you are uncomfortable speaking with me, or you feel your concern hasn't been resolved after bringing it to my attention, you can contact my department chair: Prof. Eric Barnes (608-785-8437, 2012 Cowley Hall, ebarnes@uwlax.edu).

Student Evaluation of Instruction (SEI):

UWL conducts student evaluations electronically. Approximately 2 weeks prior to the conclusion of a course, you will receive an email at your UWL email address directing you to complete an evaluation for each of your courses. In-class time will be provided for students to complete the evaluation in class. Electronic reminders will be sent if you do not complete the evaluation. The evaluation will include numerical ratings and, depending on the department, may provide options for comments. The university takes student feedback very seriously and the information gathered from student evaluations is more valuable when a larger percentage of students complete the evaluation. Please be especially mindful to complete the surveys.

Our Legal Obligations to You [<https://www.uwlax.edu/info/syllabus/>]

Sexual Misconduct

As an employee of the University of Wisconsin-La Crosse, I am a mandated reporter of sexual harassment and sexual violence that takes place on campus or otherwise affects the campus community. This means that if I receive detailed or specific information about an incident such as the date, time, location, or identity of the people involved, I am obligated to share this with UWL's Title IX Coordinator <http://www.uwlax.edu/affirmative-action/> in order to enable the university to take appropriate action to ensure the safety and rights of all involved. For students not wishing to make an official report, there are confidential resources available to provide support and discuss the available options. The contact in Student Life is Ingrid Peterson, Violence Prevention Specialist, (608) 785-8062, ipeterson@uwlax.edu. Please see <http://www.uwlax.edu/sexual-misconduct> for more resources or to file a report.

Religious Accommodations

Per the UWL Undergraduate and Graduate Catalogs <http://catalog.uwlax.edu/undergraduate/aboutuwlax/#accommodation-religious-beliefs> "any student with a conflict between an academic requirement and any religious observance must be given an alternative means of meeting the academic requirement. The student must notify the instructor within the first three weeks of class (within the first week of summer session and short courses) of specific days/dates for which the student will request an accommodation. Instructors may schedule a make-up examination or other academic requirement before or after the regularly scheduled examination or other academic requirement."

Students with Disabilities

Any student with a documented disability (e.g. ADHD, Autism Spectrum Disorder, Acquired Brain Injury, PTSD, Physical, Sensory, Psychological, or Learning Disability) who needs to arrange academic accommodations must contact The ACCESS Center (165 Murphy Library, 608-785-6900, ACCESSCenter@uwlax.edu) and meet with an advisor to register and develop an accommodation plan. In addition to registering with The ACCESS Center, it is the student's responsibility to discuss their academic needs with their instructors.

You can find out more about services available to students with disabilities at The ACCESS Center website: <http://www.uwlax.edu/access-center>

Veterans and Active Military Personnel

Veterans and active military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to me. For additional information and assistance, contact the Veterans Services Office.

<http://www.uwlax.edu/veteran-services/>. Students who need to withdraw from class or from the university due to military orders should be aware of the military duty withdrawal policy <http://catalog.uwlax.edu/undergraduate/academicpolicies/withdrawal/#military-duty-withdrawal-university>.

Specific course policies for PHY 376.

Rough course schedule (Subject to Change)

(3wks) 1. Introduction Quiz on Ch1 [TBA] (3wks) 2. Nuclear Properties Exam #1 [TBA]	(3wks) 3. Radioactive Decay Quiz on Ch3 [TBA] (2wks) 4. Nuclear Reactions (2wks) 5. Interaction of Radiation with Matter Exam #2 [TBA]	(2wks) 6. Instrumentation (2wks) 7. Health Physics Final Exam [Mon 12/18]
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GRADING	
Aspect	Total Points
Homework & Quizzes	150
Exams (#1 and #2)	200
Final Exam	200
Labs	150
<i>Total for Course</i>	700

Grading Scheme	
A	At least 660 points
AB	632-659 points
B	597-631 points
BC	562-596 points
C	491-561 points
D	421-490 points
F	Less than 420 points

The above grade boundaries may be lowered at the discretion of the instructor. (i.e. you may receive a higher grade than indicated above – you will not receive a lower grade than indicated above).

Meetings & Homework:

- Homework will be assigned on a regular basis for your benefit. Some will be collected, others will be used as practice for an in class homework quiz.
- Homework problems are an opportunity for you to test your skills and see where you need to improve. Homework is due at the beginning of class on the due date. Each problem collected will be graded on a 3-point scale. You will earn (a) 3 points if you have 95% of the problem correct, (b) 2 points if you have 75% of the problem correct, (c) 1 point if you have 50% of the problem correct. A point will be taken off if your work is messy. When applicable, homework quizzes will be given the first 15 minutes of class.

Exams:

- There will be two exams throughout the semester. These exams will contain mostly problems but may also include multiple choice, matching, short answer, short problems, etc. depending on the chapter.

Final Exam:

- The final exam will be cumulative and take place on **Mon 12/18 from 4:45-6:45p**

Expectations for Graded Work

I provide students feedback and/or scores on assignments that require individualized grading before a further assignment of a similar format is due. Generally, I return work that requires individual feedback

within 2 weeks (for exams) and 1 week (for in-class quizzes) from the date the work was due. I will notify you if I am unable to grade the work by the specified timeframe, and I will identify a revised return date.

Your graded coursework will be returned in compliance with FERPA regulations, such as in-class, during my office hours, or via the course management system through which only you will have access to your grades. After you have completed the course, any copies or records of your graded material that I retain will be accessible up to 7 weeks into the next academic term.

Labs: See the separate Laboratory Syllabus.

Excused Absences & Makeup Information:

- Assignments must be completed and handed in on the appointed dates. Late assignments will not be accepted since the solutions will be posted on D2L at the beginning of the class period.
- Exams: Written documentation [at least an email] is required to evaluate the possibility of being excused for an exam.
 - Examples of acceptable absences: death in your immediate family, car accident, serious or highly contagious illness.
 - Prescheduled university-related absences (i.e. (i.e. University athletic team competition, concert, etc.), if the instructor is notified at least 1 week in advance.
 - Unacceptable absences: leaving campus early to go to your friend's wedding rehearsal, because your ride is leaving early, etc.
 - For an excused absence:
 - an alternate exam time will be scheduled before the regularly scheduled exam.
 - If a makeup exam must be scheduled after the regularly scheduled exam, it may contain different problems from the regularly-scheduled exams and will be graded according to the instructor's prerogative. The instructor reserves the right to schedule specific times for make up exams.

Extended Absences:

If you are going to be absent for an extended period of time, you should contact the Student Life Office at 149 Graff Main Hall, 785-8062 and notify them of your absence. Then contact me about making up missed material, and be prepared with appropriate documentation.

Electronic Devices: You may not use cell phones, pagers, laptops for e-mail or web-browsing etc. during class or exams. Be considerate of your fellow students and conduct your e-business elsewhere.

Academic Misconduct: Academic misconduct is an unacceptable violation of the UW-L Student Honor Code. All work handed in for this class must be the students' own individual work. Plagiarism or cheating in any form may result in failure of the assignment or exam, failure of the course, and may include harsher sanctions. EACH STUDENT MUST MAKE HIS/HER OWN MEASUREMENTS AND OWN CALCULATIONS. Copying someone else's measurements or calculations is cheating and will be handled accordingly. Refer to the Student Handbook at <http://www.uwlax.edu/student-life/student-resources/student-handbook/> for a detailed definition (esp. section 14.03).

Getting HELP!

You are strongly encouraged to discuss the homework with other students.

(That is, you are strongly encouraged NOT to always work alone.) However, be sure that you can do the homework by yourself and that you always present your own work for Homework, Quizzes, and Exams.