

INTRODUCTION TO NUCLEAR AND PARTICLE PHYSICS

Physics 4/56301

SPRING 2016

INSTRUCTOR:

Dr. Mark Manley manley@kent.edu
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330-672-2407

CLASS HOURS: 11:00 - 12:15 M W, 110 Smith Hall

OFFICE HOURS: 3:30 - 4:30 M W
 3:00 - 4:00 T
 11:00 - 12:00 R
 (or by appointment)

TEXT: None required

PREREQUISITES: Introductory Modern Physics (PHY 36001); Pre/corequisite Mathematical Methods in the Physical Sciences II (MATH 32052). Students who do not have the proper prerequisites risk being deregistered from the class.

STUDENT LEARNING OUTCOMES: Upon successful completion of this course, students will be able to:

- Demonstrate a satisfactory level of familiarity with basic concepts of Nuclear-Particle Physics, including particle detectors and accelerators, experimental techniques, nuclear fission and fusion and reactors, medical applications, and connections to astrophysics and cosmology.
- Solve quantitative fundamental problems of subatomic physics, including radioactivity, experimental techniques, nuclear structure, particle interactions, and particle collisions and decays.

GRADE DETERMINATION:	Homework	20%
	Exam 1	25%
	Exam 2	25%
	Final Exam	30%

HOMEWORK: Problems will be assigned in class. Homework assignments *must* be handed in on time.

EXAMS: Each of the two midterm exams will cover only those chapters of the text that were covered in class since the previous exam. The final exam will be comprehensive.

COVERAGE: As indicated on the tentative course outline.

MAKEUP CLASSES: I anticipate being away occasionally because of research commitments. Make-up classes will be scheduled as needed.

CHEATING AND PLAGIARISM:

University policy 3342-3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy at http://www.kent.edu/policyreg/-policydetails.cfm?customel_datapageid_1976529=2037779 and/or ask.

STUDENTS WITH DISABILITIES:

University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

REGISTRATION REQUIREMENT:

The official registration deadline for this course is January 24, 2016.

University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashFast) prior to the deadline indicated. Registration errors must be corrected prior to the deadline.

The course withdrawal deadline is January 31, 2016.

TENTATIVE COURSE OUTLINE:

Week	Date	Day	Tentative Schedule
1	Jan 18	M	MLK Jr. Day–No Classes
	Jan 20	W	Introduction
2	Jan 25	M	Properties of the Nucleus
	Jan 27	W	Properties of the Nucleus
3	Feb 1	M	Properties of the Nucleus
	Feb 3	W	The Nuclear Force
4	Feb 8	M	The Nuclear Force
	Feb 10	W	The Nuclear Force
5	Feb 15	M	The Nuclear Force
	Feb 17	W	Exam 1
6	Feb 22	M	Nuclear Structure Models
	Feb 24	W	Nuclear Structure Models
7	Feb 29	M	Nuclear Structure Models
	Mar 2	W	Nuclear Structure Models
8	Mar 7	M	Radioactive Decay
	Mar 9	W	Radioactive Decay

TENTATIVE COURSE OUTLINE (Continued):

Week	Date	Day	Tentative Schedule
9	Mar 14	M	Experimental Aspects
	Mar 16	W	Experimental Aspects
10	Mar 21	M	Spring Break–No Classes
	Mar 23	W	Spring Break–No Classes
11	Mar 28	M	Applications of Nuclear Physics
	Mar 30	W	Exam 2
12	Apr 4	M	Alpha Decay
	Apr 6	W	Beta Decay
13	Apr 11	M	Gamma Decay
	Apr 13	W	Fission and Fusion
14	Apr 18	M	Particle Physics
	Apr 20	W	Particle Physics
15	Apr 25	M	Particle Physics
	Apr 27	W	Particle Physics
16	May 2	M	Particle Physics
	May 4	W	Particle Physics (Class Ends at Noon)
	May 13	F	Final Exam (10:15 a.m. – 12:30 p.m.)