

PHYSICS 364

Nuclear and Elementary Particle Physics

Spring 2013

Instructor : Prof. George E. McCluskey, Jr.
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Office : Lewis Lab 409
Office Hours : Generally TTH Mornings
or by Appointment

Course Schedule : MWF 9:10 - 10:00 ;
Lewis Lab 511

Textbooks : Nuclear Physics in a Nutshell
by Carlos A. Bertulani – Princeton University Press

Introduction to Elementary Particles by David
Griffiths
Second, Revised Edition – Wiley – VCH

Course Requirements : 1. Attendance is required
2. Read all assigned material
3. Complete all assignments on time
4. See instructor for any assistance

Grading : Your grade will be determined as follows :

Homework	30%
Mid-Term Exam	30%
Final Examination	40%

Course Material : Sections Chapters 2 - 12 of Bertulani

**Chapters 1 - 5 and parts of 6 - 9 of
Griffiths**

Any supplementary material

TOPICS TO BE COVERED

- 1. Overview of the Course and Historical Introduction**
- 2. Basic Properties of Nuclei**
- 3. Two Nucleon Systems – The Deuteron**
- 4. Scattering of Nucleons, Electrons and Nuclei**
- 5. Relativistic Dynamics**
- 6. Models of the Nucleus**
- 7. Nuclear Reactions – Alpha Decay, Beta Decay, Gamma Decay, Fission and Fusion**
- 8. Nuclear Astrophysics and Big Bang Nucleosynthesis**
- 9. Introduction to The Elementary Particles – Interactions, Symmetries, Bound States**
- 10. Quantum Electrodynamics**
- 11. Quantum Chromodynamics – Leptons, Quarks, Gluons and their**

Interactions

12. Miscellaneous Topics

Accommodations for students with disabilities : If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.