Syllabus for PHY492, Spring 2007

Lecturer: Prof. Carl Bromberg; E-mail: bromberg@pa.msu.edu; Office: Rm. 3225 BPS; Phone:5-9200 Ext. 2122; Office hrs: Mon. & Wed.,10:30-12:30, or by appointment.

TA: Yixing Wang E-mail: wangyix@pa.msu.edu; Phone: 59200, ext.2080.
See Yixing for grading issues. Disagreements will be forwarded to me ONLY by Yixing

Lectures:
- Mon. and Wed., 9:00 - 10:10 pm, in room 1415 BPS (see Course Schedule).
- Optional Seminar: bi-weekly, based on 5 lectures in streaming video by L. Lyons.

Required Textbooks:
- 1)"Introduction to Nuclear and Particle Physics" (2nd Edition), A. Das and T. Ferbel, World Scientific Pub., 2003, ISBN 981-238-744-7 (pbk)
  2)"Facts and Mysteries in Elementary Particle Physics", M. Veltman, World Scientific Pub., 2003, ISBN 981-238-149-X (pbk)

Optional Text:
- "Statistics for Nuclear and Particle Physicists", Louis Lyons, Cambridge University Press, 1989, ISBN 0 521 37934 2 (pbk)

Course Topics:
- Course covers the topics shown in the **Course Schedule** (on the next page).
- Lectures may not cover all topics presented in the **Reading Assignments**. All topics, in the assigned reading or presented in lecture may appear on an exam.
- Lectures on Mon. and Wed. will be posted on the Course Web site by Fri of that week.

Tier II Writing Assignment
- You are required to write an 8-10 page technical paper (referenced) on a subject to be assigned in class on Monday, April 2.
- A 1 page detailed outline or draft of this paper will be due on Monday, April 16. Deadline for submission is May 4, 9:45 am. No exceptions.

Homework (HW) and Exams:
- There will be 7 homework assignments with due dates as indicated in the **Course Schedule**. Homework handed in late will not be graded, but will be logged. All missing homework assignments must be submitted by the last class on April 27.
- Two, **60 minute exams** will be given in class on the dates indicated in the Course Schedule. **Note Below**: Tier II paper **is** the Final Exam
- Documented medical (or other) excuses for **one** 60 minute exam will be considered on a case by case basis. Resolution may involve an oral exam.

Grades
- HW (~2 points/problem, 100 points), 2 exams (200 points each), Tier II paper (100 points), Straight scale. >400 points will get a 4.0, and cuts are 40 points lower for each 0.5 in grade. If a Tier II paper is not submitted, you will receive a 0 course grade.
- Frequently check the **WEB** site, **http://www.pa.msu.edu/courses/PHY492**, for announcements, HW (hints, corrections) and exam solutions, scores and grades.

Miscellaneous
- No HEAD-phones, IPODs, CD-players, CELL-phones, or HATs in class.

PHY492 Schedule
Spring 2007

W	D	Date	L	Subjects	D&F	V	HW	HW Due
1	M	Jan. 8	1	Relativstic Kinematics, Forces	Apx–A	1, 4		
	W	Jan. 10	2	Rutherford Scattering	1			
2	M	Jan. 15		**M. L. K. Day - no classes**				
	W	Jan. 17	3	Properties of Nuclei	2		odd #'d prob.	Ch. 1
3	M	Jan. 22	4	Nature of the Nuclear Force				
	W	Jan. 24	5	Liquid Drop Model	3			
4	M	Jan. 29	6	Shell Model				
	W	Jan. 31	7	Alpha Decay	4		odd #'d prob.	Ch. 2-3
5	M	Feb. 5	8	Beta Decay				
	W	Feb. 7	9	Applications of Nuclear Physics	5			
6	M	Feb. 12	10	Elementary Particle Quantum Numbers	9-10	2-3	odd #'d prob.	Ch. 4-5
	W	Feb. 14		**60-min. Exam (L1-9)**				
7	M	Feb. 19	11	Hadrons and Resonances		8-11		
	W	Feb. 21	12	Symmetries I				
8	M	Feb. 26	13	Symmetries II				
	W	Feb. 28	14	Symmetries III	11-12		odd #'d prob.	Ch. 9-10
				Spring Break				
9	M	Mar. 12	15	Neutral Kaons and CP violation				
	W	Mar. 14	16	Gauge Bosons and Quark Mixing				
10	M	Mar. 19	17	Matter - Antimatter Oscillations				
	W	Mar. 21	18	Quark-onium				
11	M	Mar. 26	19	QCD	13-14	2-3	odd #'d prob.	Ch. 11-12
	W	Mar. 28	20	Lepton Scattering				
12	M	Apr. 2	21	Neutrinos - Mass and Flavor Oscillations		**(Tier-II Assign Topics)**		
	W	Apr. 4	22	Beyond the Standard Model	15			
13	M	Apr. 9	23	Energy Deposition in Media	6	5-7	odd #'d prob.	Ch. 13-14
	W	Apr. 11		**60-min. Exam (L10-23)**				
14	M	Apr. 16	24	Introduction to Particle Detectors	7	**(Tier-II Outline Due)**		
	W	Apr. 18	25	EM & Hadronic Particle Detection				
15	M	Apr. 23	26	Accelerators I	8			
	W	Apr. 25	27	Accelerators II			odd #'d prob.	Ch 6-8
	F	May	4	**(Tier-II Paper Deadline)**				