Graduate Accelerator Physics

January 2013 USPAS: Duke University

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Day	Topic	Who	Lab?
Mon AM	Intro, Relativity, Luminosity	Todd	
Mon PM	Weak Focusing, Stability Conditions	Waldo	
Tue AM	Weak Focusing, Hamiltonians	Waldo	
Tue PM	Magnets and Field Expansions	Todd	Yes
Wed AM	Strong Focusing Theory I	Waldo	
Wed PM	Strong Focusing Theory II	Waldo	
Thu AM	Lattice Exercises I	Todd	
Thu PM	Lattice Exercises II	Waldo	Yes
Fri AM	Lattice Design I	Todd	
Fri PM	Lattice Design II	Todd	Yes
Mon AM	Longitudinal Motion (Synchrotron)	Waldo	
Mon PM	Longitudinal Motion (Linac)	Todd	
Tue AM	Synchrotron Radiation	Waldo	
Tue PM	Synchrotron Light Facility Lattices	Todd	Yes
Wed AM	Resonances and Nonlinear Dynamics I	Waldo	
Wed PM	Nonlinear Dynamics II	Todd	
Thu AM	Space Charge and Beam-Beam	Todd	
Thu PM	Measurement Methods	Todd	Yes (Exam)
Fri AM	Polarization and Spin Dynamics	Waldo	

Table 1: Class Schedule/Syllabus for January 2013 USPAS Graduate Accelerator Physics

Text: "An Introduction to the Physics of Particle Accelerators" (2nd Edition), M. Conte and W.W. MacKay (World Scientific, 2008)

Grading: 40% homework, 20% overnight final exam, 20% computer labs, 20% class participation.

Homework: Homework is due at the start of class on the day after it is assigned. Graded homework and solutions will be distributed then, so no late homework can be accepted to contribute to your grade. You may collaborate with your classmates on the homework if you are contributing to the solution and understanding of the material. Like any good scientist, you should **cite** the contributions of your teammates, as referencing sources is an important part of ethical publication. Everyone should turn in individual copies of the homework. Use of Mathematica, spreadsheets, and other computer tools is encouraged.

Final Exam: The final exam is an overnight "take-home" exam that will be handed out Thursday afternoon and is due at the start of class on Friday. You may use books and other references (again, with citation) but you should not collaborate with other class members on this exam.

Study time: At least one of us will usually be in the study room for consultation in the early evenings. We are also available for questions at breakfast and dinner, and through email. We endeavor to be approachable, and hope that you enjoy this course and learn exciting new ideas about accelerator physics!