

Graduate Accelerator Physics

June 2011 USPAS: Huntington / SUNY Stony Brook
 Waldo MacKay (mackay@bnl.gov) and Todd Satogata (satogata@jlab.org)

June 13–24, 2011

Day	Topic	Lecturer	Lab?
Mon Jun 13 AM Mon Jun 13 PM	Intro, Relativity, Luminosity Weak Focusing, Stability Conditions	Todd Waldo	
Tue Jun 14 AM Tue Jun 14 PM	Weak Focusing, Hamiltonians Weak Focusing, Hamiltonians	Waldo Waldo	Yes
Wed Jun 15 AM Wed Jun 15 PM	Magnets Strong Focusing	Todd Waldo	
Thu Jun 16 AM Thu Jun 16 PM	Strong Focusing Lattice Exercises	Waldo Todd	Yes
Fri Jun 17 AM Fri Jun 17 PM	Lattice Exercises Lattice Design	Waldo Todd	
Mon Jun 20 AM Mon Jun 20 PM	Longitudinal Motion (Synchrotron) Longitudinal Motion (Linac)	Waldo Todd	
Tue Jun 21 AM Tue Jun 21 PM	Synchrotron Radiation Synchrotron Radiation, Cooling	Waldo Waldo	Yes
Wed Jun 22 AM Wed Jun 22 PM	Nonlinear Dynamics Space Charge, Beam-Beam	Todd Waldo	
Thu Jun 23 AM Thu Jun 23 PM	Position Measurements and Spectra Measurement Methods	Waldo Todd	Yes (Exam)
Fri Jun 24 AM	Spin	Waldo	

Table 1: Class Schedule/Syllabus for June 2011 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 exam (June 23), 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!