Graduate Accelerator Physics

January 2015 USPAS: Old Dominion University
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Day	Who	Topic	Chapter	Lab?
Mon AM	Todd	Intro, Relativity, Luminosity	1	
Mon PM	Todd	Weak Focusing, Stability Conditions	2	
Tue AM	Vasiliy	Weak Focusing, Hamiltonians	2-3	
Tue PM	Todd	Magnets and Field Expansions	4	
Wed AM	Vasiliy	Strong Focusing Theory I	5	
Wed PM	Vasiliy	Strong Focusing Theory II	5	
Thu AM	Todd	Lattice Exercises I	6	
Thu PM	Todd	Lattice Exercises II	6+	Yes
Fri AM	Todd	Lattice Design I	–	
Fri PM	Vasiliy	Lattice Design II, Coupling	–, 6	Yes
Mon AM	Todd	Longitudinal Motion (Synchrotron)	7	
Mon PM	Todd	Longitudinal Motion (Linac), Bunch Compression	9, –	Yes
Tue AM	Todd	Synchrotron Radiation	8	
Tue PM	Todd	Synchrotron Light Facility Lattices, Emittance Exchange	–	
Wed AM	Todd	Space Charge and Beam-Beam	11	
Wed PM	Alex	Colliders, Luminosity, Crabbing	App D	Yes
Thu AM	Todd	Nonlinear Dynamics, Resonant Extraction	10	
Thu PM	Todd	Measurement Methods	14	(Exam)
Fri AM	Vasiliy	Polarization and Spin Dynamics	13	

Table 1: Class Schedule/Syllabus for January 2015 USPAS Graduate Accelerator Physics

Text: "An Introduction to the Physics of Particle Accelerators" (2nd Edition), M. Conte and W.W. MacKay (World Scientific, 2008), plus handouts and posted references on the class website.

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!