Graduate Accelerator Physics

January 2017 USPAS: Old Dominion University
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Day	Who	Topic	Chapter	Lab?
Mon AM	Todd	Intro, Relativity, Luminosity	1	
Mon PM	Cedric	Weak Focusing, Stability Conditions	2	
Tue AM	Todd	Trajectory Mechanics, Hamiltonians	3	
Tue PM	Todd	Magnets and Field Expansions	4	Yes
Wed AM	Cedric	Strong Focusing Theory I	5	
Wed PM	Cedric	Strong Focusing Theory II and MAD-X I	5	
Thu AM	Cedric	Lattice Exercises I and MAD-X II	6	
Thu PM	Cedric	Lattice Exercises II and MAD-X III	6+	Yes
Fri AM	Todd	Lattice Exercises III	6+	
Fri PM	Todd	Beams and Emittances	–	
Mon AM	Todd	Synchrotron Motion	7	
Mon PM	Todd	Linacs and RF	9	
Tue AM	Todd	Synchrotron Radiation	8	
Tue PM	Todd	Synchrotron Light Facility Lattices, Emittance Exchange	–	Yes
Wed AM	Todd	Resonances I	10	
Wed PM	Alex	Resonances II	10	Yes
Thu AM	Todd	Space Charge I	11	
Thu PM	Todd	Space Charge II	11	(Exam)
Fri AM	:)	Polarization and Spin Dynamics or Collective Effects	13	

Table 1: Class Schedule/Syllabus for January 2017 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 Jan 26 in the afternoon and is due at the start of class on Friday Jan 27. 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!