Accelerator Physics

January 2019 USPAS: Knoxville
http://www.toddsatogata.net/2019-USPAS/
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Day	Who	Topic	Chapter	Lab?
Mon AM	Both	Introduction, Relativity Refresher	1	
21 PM	Steve	Linear Motion and Stability	2, 3	
Tue AM	Todd	Strong Focusing Transverse Optics	3	
22 PM	Steve	Longitudinal and Off Momentum Motion	4	Yes
Wed AM	Steve	Emittances and Phase Space	5	
23 PM	Todd	Magnets and Magnet Design	6	
Thu AM	Steve	RF Cavities and Synchrotron Motion	7	
24 PM	Steve	Linear Errors and Their Correction	8	Yes
Fri AM	Todd	Lattice Exercises	–	
25 PM	Todd	Lattice Exercises and Insertions	–	
Mon AM	Steve	Sextupoles and Chromaticity	9	
28 PM	Todd	Octupoles, Detuning, Slow Extraction	10	Yes
Tue AM	Steve	Synchrotron Radiation and Damping	11	
29 PM	Todd	Synchrotron Light Facility Lattices	–	
Wed AM	Steve	Linacs - Protons and Ions	13	
30 PM	Steve	Beam-Beam Interaction: 1-D Resonances	15	
Thu AM	Todd	Chaos and Nonlinear Dynamics	16	
31 PM	Todd/Keil/Bhawin	Linacs - Electrons and ERLs	14+	
Fri AM	:)	Free lecture: By Request!	–	

Table 1: Class Schedule/Syllabus for the January 2019 USPAS course "Accelerator Physics".

Text: "An Introduction to Linear and Nonlinear Accelerator Dynamics", S. Peggs and T. Satogata (Cambridge University Press, 2017), plus handouts and posted references on the class website.

Grading: 60% homework, **NO** final exam, 20% computer labs, 20% class participation.

Homework: Homework is due at the start of class on the day after it is assigned. Solutions will be distributed then, so late homework will not contribute to your grade. You may collaborate with your classmates so long as you contribute to the homework solutions and can demonstrate that you understand the material. Like any good scientist, you should **cite** the contributions of your teammates: referencing sources is an important part of ethical publication. Everyone should turn in individual copies of the homework. Please be able to plot data – printers are available. The use of Mathematica, spreadsheets, and other computer tools is encouraged.

Final Exam: The overnight "take-home" final exam, handed out Thursday Jan 31, is due at the start of Friday Feb 1. You may use books and other references (with citations) but may not collaborate with other class members.

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. By being approachable we help you to enjoy this course while learning exciting new accelerator physics concepts!