Dr. Todd Satogata
Office hours: 15:00ish-16:15 Tue/Thu TBD
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ODU Physics 417/517
Class: 16:20-17:35 Tue/Thu Gornto 422
http://www.toddsatogata.net/2018-ODU-AP

Introduction to Accelerator Physics

Day	What	Who	Due
Tue Jan 09	Overview of Accelerators	Todd	–
Thu Jan 11	Special Relativity and E&M Fundamentals	Todd	–
Tue Jan 16	Weak Focusing and Stability	Todd	HW1
Thu Jan 18	Weak Focusing and Stability	Todd	–
Tue Jan 23	Trajectory Mechanics	Todd	HW2
Thu Jan 25	Hamiltonians and Hamiltonian Dynamics	Todd	–
Tue Jan 30	Hamiltonians and Hamiltonian Dynamics	Todd	HW3
Thu Feb 01	Magnets and Magnet Design	Todd	–
Tue Feb 06	Strong Focusing I	Todd	HW4
Thu Feb 08	Strong Focusing II	Todd	–
Tue Feb 13	Lattice Exercises I	Todd	HW5
Thu Feb 15	Lattice Exercises II	Todd	–
Tue Feb 20	Lattice Exercises III	Todd	HW6
Thu Feb 22	Emittances and Beams	Todd	–
Tue Feb 27	**MIDTERM REVIEW**	Todd	HW7
Thu Mar 01	in-class **MIDTERM**	Todd	–
Tue Mar 06	no class (spring break)	all	–
Thu Mar 08	no class (spring break)	all	–
Tue Mar 13	Sigma Matrix and Observables	Todd	HW8
Thu Mar 15	Observables and Instrumentation	Todd	–
Tue Mar 20	RF Cavities	Todd	HW9
Thu Mar 22	Linear Accelerator Dynamics	Todd	–
Tue Mar 27	Synchrotron Longitudinal Dynamics	Todd	HW10
Thu Mar 29	Synchrotron Radiation	Todd	–
Tue Apr 03	Synchrotron Radiation	Todd	HW11
Thu Apr 05	Light Source Lattices	Todd	–
Tue Apr 10	Medical Accelerators	Todd	HW12
Thu Apr 12	Collective Effects	Todd	–
Tue Apr 17	Nonlinear Dynamics	Todd	–
Thu Apr 19	Student Presentations	Todd	–

Table 1: Class Schedule/Syllabus for ODU Physics 417, Introduction to Accelerator Physics (Subject to revision depending on how much we have to review!)

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

Grading: 50% homework, 20% in-class midterm (Mar 1), 20% presentations, 10% class participation.

Homework: Homework is due at the start of the Tuesday class the week after it's assigned. Late homework will be penalized at a rate of 10% per 24 hours. Solutions will be distributed/posted at the class following when the homework is due, after which no further late homework can be accepted to contribute to your grade. Collaboration is an important part of being a working scientist; 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 must **cite** the contributions of your teammates and other references that you may have used. Everyone should turn in individual copies of the homework. Use of Mathematica, spreadsheets, and other computer tools is encouraged.

Final Exam/Presentations: During the last week of class, you'll give a 15(+5) minute talk on a topic relevant to accelerator physics. I'll provide a suggested list of topics in late March, though you can talk on another relevant topic with instructor approval.

Office Hours: I will be in office hours from 15:00-16:15 on Tuesdays and Thursdays before classes where I'm scheduled to be present according to the above syllabus. I am also quite responsive to email nearly 24/7 and can be available via phone/skype/viber if needed.