



# Introduction

## **Fundamental Accelerator Theory, Simulations and Measurement Lab**

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Oak Ridge National Laboratory**



# Daily Schedule

- **9:00 am - 12:00 pm: Morning Session, generally two lectures with a break**
- **12:00 - 1:30 pm: Lunch**
- **1:30 - 5:00 pm: Afternoon Session, generally laboratory and simulations**

- **In the evening during the “homework time”, instructors will be available for further discussion on course related topics.**
- **There will be daily homework. You are allowed, and even encouraged to work in groups. Don’t “stew” over problems too long...ask for help!**
- **Everyone will perform 8 laboratory experiments and computer simulations. These will be done in groups, with each group submitting a lab report.**
- **Final exam on the morning of Friday January 23 (three hours) and no lab in the afternoon.**



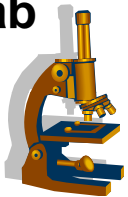
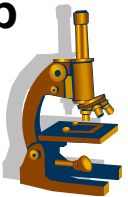
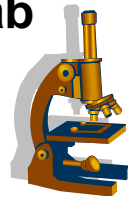
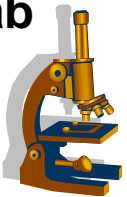
# Texts and Reference Material

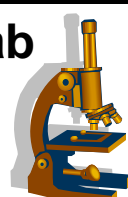
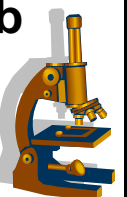
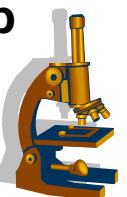
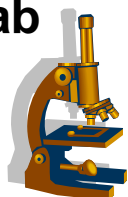
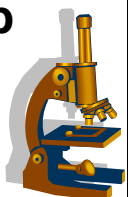
- **Wiedemann, *Particle Accelerator Physics, Volume 1***
- **Selected Chapters from Wangler, *Principles of RF Linear Accelerators***
- ***Links to the Lectures, Labs and Problem Sets are here:***

<http://www.ornl.gov/~jzh/JHolmes/USPASAccFund.html>



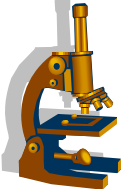
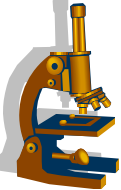
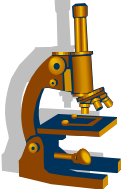
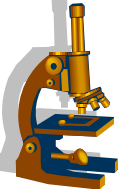
# Schedule

	<b>Monday Jan. 12</b>	<b>Tuesday Jan. 13</b>	<b>Wednesday Jan. 14</b>	<b>Thursday Jan. 15</b>	<b>Friday Jan. 16</b>
9:00 am to 12:00 pm	Lecture	Lecture	Lecture	Lecture	Lecture
1:30 pm to 5:00 pm	Lecture	Lab 	Lab 	Lab 	Lab 

	<b>Monday Jan. 19</b>	<b>Tuesday Jan. 20</b>	<b>Wednesday Jan. 21</b>	<b>Thursday Jan. 22</b>	<b>Friday Jan. 23</b>
9:00 am to 12:00 pm	Lecture	Lecture	Lecture	Lab 	Final Exam
1:30 pm to 5:00 pm	Lab 	Lab 	Lab 	Lab 	

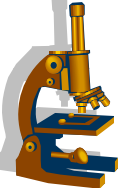
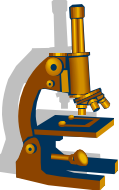
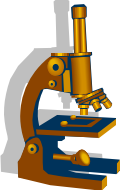
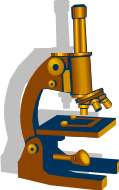


# Content – Week 1

	<b>Monday Jan. 12</b>	<b>Tuesday Jan. 13</b>	<b>Wednesday Jan. 14</b>	<b>Thursday Jan. 15</b>	<b>Friday Jan. 16</b>
<b>9:00 am to 12:00 pm</b>	<b>Lecture 1 a- Introduction b- Review of Units, Relativity and E&amp;M</b>	<b>Lecture 3 Particle Acceleration and RF Cavities</b>	<b>Lecture 4 RF Acceleration in Linacs</b>	<b>Lecture 5 a- RF Acceleration in Linacs b- Longitudinal Dynamics</b>	<b>Lecture 6- Transverse Beam Optics, Part I</b>
<b>1:30 pm to 5:00 pm</b>	<b>Lecture 2 Magnetic Fields and Magnet Design</b>	<b>Lab</b>  	<b>Lab</b>  	<b>Lab</b>  	<b>Lab</b>  



# Content – Week 2

	<b>Monday Jan. 19</b>	<b>Tuesday Jan. 20</b>	<b>Wednesday Jan. 21</b>	<b>Thursday Jan. 22</b>	<b>Friday Jan. 23</b>
<b>9:00 am to 12:00 pm</b>	<b>Lecture 7 Transverse Beam Optics, Part II</b>	<b>Lecture 8 Off momentum effects and Longitudinal Dynamics in Rings</b>	<b>Lecture 9 a- Synchrotron Radiation b-Collective Effects</b>	<b>Lab</b> 	<b>Final Exam</b>
<b>1:30 pm to 5:00 pm</b>	<b>Lab</b> 	<b>Lab</b> 	<b>Lab</b> 	<b>Lab</b> 