SAVING AND SENDING FILES

Save your lab as a Microsoft Excel file, either Windows or Mac. The file name for each XL lab should be in the following format:

		"ABC" are your initials	
XL#xx.ABC.xlsx			
	"xx" represents the	e two digit lab number (01, 02	2, 03,

Save all work to your personal Advanced Physics dropbox. When making a final submission of a lab, make a copy of the document and mark one of the copies as XL#xx.ABC(final).xlsx

...)

GENERAL COMMENTS ABOUT LAB ANALYSES

1. Your plot(s) will display all or some of the following significant properties:

- Region(s) of constant slope
- Region(s) of upward concavity
- Region(s) of downward concavity
- Maxima
- Minima
- Inflection points
- Discontinuities
- Horizontal region(s)
- Asymptotes
- Intersection(s) with the x-axis (roots)

For each property exhibited by your graph, discuss the physical reason that property exists (connect the shape or value of the graph to the physical situation that produced it).

2. The lab may have asked you to make multiple plots reflecting different physical situations (where one or more parameter affecting the plot has been changed). Be sure to discuss what aspect(s) of your plots are altered from plot to plot, and why they are so altered (i.e., what physical change is represented?).

3. Explain how you would use your plot to answer specific questions about the physical system you are modeling. Give a couple of examples of questions answered by the plot.

4. How is the plot you produced superior to a data table for conveying information about the physical system you are modeling? Specifically, what can you see by looking at the plot that you couldn't see by looking at a data table?

Title Page: The first worksheet
in your lab must have a text box
that contains all of the required
information — 5 %

information — 5 %			Score	A Score of "4" =	A Score of "3" =	A Score of "2" =	A Score of "1" =	
	Title Page				Contains Descriptive Title, Name, Course, Instructor, Date, Signed Honor Pledge	Omits one or two of the required components	Omits more than two of the required components	Largely incomplete or not present
		Headers	20%		ALL column headers correctly and clearly labeled; correct units included	MOST column headers correctly and clearly labeled but may lack correct units	Column headers generally clear but without (correct) units	No consideration given to this style element
	Data and Worksheets	Significant Figures	20%		ALL data shown with correct/reasonable number of significant figures	MOST data shown with correct/reasonable number of significant figures	SOME data shown with correct/reasonable number of significant figures; use of significant figures is inconsistent.	No consideration given to this style element
Data and Worksheets: All individual worksheets need to be formatted		Parameters	20%		ALL parameters/constants clearly defined (including units) and used ("flexible spreadsheet")	MOST parameters clearly defined and used ("flexible spreadsheet") but some units excluded	SOME parameters/constants are defined clearly and/or "flexible spreadsheet" inconsistently employed	No consideration given to this style element
		Spreadsheet Organization	20%		 ALL data logically organized, clearly presented and easy-to-read; uses a clear, consistent style template for all data 	MOST data logically organized, clearly presented and easy-to-read	SOME data is poorly organized or poorly formatted	No consideration given to this style element
and arranged as indicated — 10 9	nged as — 10%	Worksheet Tabs	20%		 ALL Worksheet "tabs" are arranged in logical sequence and clearly indicate contents [data+calcs, plot (including correct variables), diagram, discussion, etc.] of each "page" 	MOST Worksheet "tabs" indicate content of each "page" and are arranged in logical sequence	 SOME Worksheet "tabs" indicate content of each "page" and/or are NOT arranged in logical sequence 	No consideration given to this style element
		System Description ("Plot Caption")	25%		Concise written description of the physical system (with parameters, initial conditions, etc) and diagram (as appropriate) included on every plot	Description of the physical system not included on all plots OR lacks important details (physical parameters, etc)	Description of the physical system NOT included on most plots AND lacks important details (physical parameters, etc.)	No consideration given to this style element
		Plot Titles	15%		ALL plots appropriately titled — dependent and independent variables listed, descriptive/informative title	 MOST plots appropriately titled — dependent and independent variables listed, descriptive title 	 MOST plots titled but do not correctly list dependent and independent variables and/or use descriptive title 	No consideration given to this style element
		Axes Labels	10%		ALL axes correctly labeled and include units	MOST axes correctly labeled and include units	Axes incorrectly labeled and/or omit units	No consideration given to this style element
Plots and Charts: Plots and charts: Plots and charts must be formatted in a style consistent with	Plots and Charts	Axes Format	3%		ALL axes and axes values gray and include minor tick marks	MOST axes and axes values gray and include minor tick marks	 SOME axes and axes values gray and/or do not include minor tick marks 	No consideration given to this style element
	and	Plot Area	3%		ALL chart borders, colored chart areas and gridlines removed	MOST chart borders, colored chart areas and gridlines removed	SOME chart borders, colored chart areas and gridlines removed	No consideration given to this style element
	Plot Lines	3%		ALL plots use distinct line colors and increased line weight	MOST plots use distinct line colors and increased line weight	SOME plots use distinct line colors and/or increased line weight	No consideration given to this style element	
	ent with	Data Points	3%		ALL experimental data plotted as "points" not smooth curve (as appropriate)	MOST experimental data plotted as "points" not smooth curve	 SOME experimental data plotted as "points" or plotted as points with connecting lines 	No consideration given to this style element
the Reference and Style Guide for Microsoft		Legends	3%		ALL plots include clear, correctly labeled legends (as appropriate)	MOST plots include clear, correctly labeled legends (as appropriate)	SOME plots include clear, correctly labeled legends (as appropriate)	No consideration given to this style element
Excel –	- 15%	Required Plots	15%		•Includes ALL of the required plots in the lab	•Includes MOST of the required plots in the lab	•Includes SOME of the required plots in the lab	Does NOT include any of the required plots
		General Style	20%		 ALL plots produced using a clear, consistent style template (fonts, font sizes, axes labels, plot annotations) 	MOST plots produced using a clear, consistent style template (fonts, font sizes, axes labels, plot annotations)	Plots produced with an UNCLEAR and/or INCONSISTENT style template (fonts, font sizes, axes labels, plot annotations)	No consideration given to this style element

Procedure: This section is one of the most important sections of your lab. In it, you are expected to describe and explain the mathematical and physical models that you used while investigating the system in question. This section should include a complete derivation of the relationships used and clear diagrams. **— 25%**

Revised 9/20/2011		1	Score	A Score of "4" =	A Score of "3" =	A Score of "2" =	A Score of "1" =
Purpose + Procedure — Mathematical Methods and Physical Models	Statement of Purpose	10%		 Includes a detailed, clear, and concise statement of the purpose of the lab (with diagram as appropriate) that reveals a depth of understanding of nature of the problem and the physics involved 	 Includes a general statement of purpose of the lab but does not elaborate on important physical concepts or mathematical/spreadsheet techniques to be employed or explored 	 Alludes to, but does not specifically state, the purpose of the lab 	Includes no reference to the purpose of the lab exercise
	Discussion of Physics	35%		 Clearly and thoroughly discusses and explains (in a step-by-step fashion) the physical models and mathematical methods used in the lab 	Discusses and explains MOST aspects of physical models and mathematical methods used in the lab	Describes but does not completely explain physical or mathematical models employed in the lab	Fails to discuss/explain models employed in the lab
	Diagrams and Screenshots	15%		Clear, well-labeled diagrams of the physical system integrated into the procedure section	Diagrams are complete and well-labeled but not thoroughly/completely integrated into the discussion of the physical and mathematical models	 Diagrams are incomplete or poorly labeled and not thoroughly/completely integrated in to the discussion of the physical and mathematical models 	Fails to include appropriate diagrams
	Derivations	20%		Concise, organized and complete presentation of all relevant algebraic derivations <i>Integrated</i> into the procedure section	 Algebraic derivations are generally complete but not thoroughly/completely integrated into the discussion of the physical and mathematical models or not clear linked to the appropriate diagrams 	 Algebraic derivations are incomplete and are not thoroughly/completely integrated in to the discussion of the physical and mathematical models 	Fails to include algebraic derivations
	Spreadsheet Values	5%		Discussion includes a thorough explanation of how and why "intermediate" spreadsheet values where obtained/calculated	Discussion includes a reasonable explanation of how and why "intermediate" spreadsheet values where obtained/calculated	 Includes a discussion of how "intermediate" values where obtained/calculated without thorough explanation 	No consideration given to how and why "intermediate" values where obtained/calculated
	Overall Presentation	15%		Demonstrates a sophisticated understanding of the physical models employed	Demonstrates a sound but, at times incomplete, understanding of the physical models employed	Demonstrates an inconsistent/incomplete understanding of the physical/mathematical models employed	Fails to demonstrates a basic understanding of the physical/mathematical models employed
Analysis of Plots + Questions, Answers and Annotations	Lab Questions	5%		Clearly and correctly answers all questions posed in the lab and includes all required values	Answers most questions in the lab correctly; some answers are incomplete or lack relevant data	Answers some questions posed in the lab; answer are incomplete or lack relevant data	Fails to answer questions posed in the lab
	Plot Annotations	5%		 Uses clear "annotation lines" and "callouts" to highlight estimated answers (as appropriate) and point out significant plot features or data; annotations stylistically consistent from plot to plot 	Includes some plot annotations that emphasize important trends/data; annotations generally consistent with stylistic expectations	Does not include a complete set of clear plot annotations and/or annotations NOT consistent with stylistic expectations	Does not include plot annotations (as appropriate)
	General Plotting Questions	15%		 Answers in detail ALL applicable general questions pertaining to specific plot features—minima, maxima, asymptotes, roots, inflection points, regions of constant slope, etc.—and the importance of graphical analysis 	Answers MOST applicable general questions pertaining to specific plot features; answers may lack sufficient detail	Answers SOME applicable general questions pertaining to specific plot features	Does NOT address general questions pertaining to specific plot features.
	Discussion of Trends	25%		Identifies, discusses and explains (in detail) important physical concepts or trends in the data	Identifies and discusses most of the important physical concepts or trends in the data	Identifies some important physical concepts or trends, but explanations are limited or incomplete	Does not identify important physical concepts or trends
	Diagrams + Plots	20%		 Relevant plots and diagrams <i>integrated</i> into the analysis AND two or more <i>additional relevant</i> plots are included 	 Includes required plots or diagrams in the analysis and may include an <i>additional relevant</i> plot as part of the analysis 	 Alludes to but does not include relevant plots or diagrams as a part of the analysis and/or plots and discussion and not clearly linked 	 Plots or calculations are incorrect or inconsistent with stated conclusions; does not include relevant plots or diagrams as a part of the analysis
	Overall Presentation	30%		 Analysis of the results is thorough and demonstrates a sophisticated understanding of the underlying physical and mathematical principles. 	 Analysis is largely complete but includes some mistakes or omissions; has some difficulty explaining the physical concepts in a clear manner 	 Analysis includes some significant mistakes or omissions; relies almost exclusivelyon a mathematical analysis (as opposed analyzing the physical concepts) 	Analysis is significantly flawed; mistakes severely interfere with meaning and understanding

Analysis + Questions: The other important section of the lab, this portion of the lab report will include a discussion, analysis and explanation of important mathematical and physical trends that show up in each lab and answers and annotations to questions posed in the lab. **—45%**