9/15/2022 DATE
☑ REQUIRED COURSE
☐ ELECTIVE COURSE

MSD DIVISION
☐ NEW COURSE
☑ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	PHY-131			TITLE: *(30 Characters Max)*			College Physics II						
SEM CR HRS:	4	Lecture:		3		Lab:	3					ECH:	6
Course Level:	☐ Gen Ed / IAI ☑ Baccalaureate /Non-IAI		☐ Career/Technical ☐ Dev Ed/ Not in Degree Audit			Clinical Practicum:	0	SOE/ Internship:	0	SOE ECH:	0		
COURSE PCS #	11 - 40.0801			IAI Code						Contact Hours (Minutes Per Week)			
Repeatable (Y/N):	N	Pass/Fail (Y/N):	N	Variable Credit (Y/N):	N	Min:		Max:		16 Wks	300	8 wks	600
Prerequisites:	PHY-130												
Catalog Description: (40 Word Limit)	An introduction to electricity and magnetism, wave motion, optics, and basic modern physics for pre-professional, arts and sciences, and four-year technology majors. This course is to be taken with PHY130 to form a complete sequence.												

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Non-Clinical Internship/ SOE
Electric Charge and Electric Fields	4	3		
Electric Potential and Electric Energy	4	3		
Current and Resistance	3	6		
Direct Current Circuits	5	3		
Magnetism	4	3		
Induced Voltages and Inductance	4	3		
Vibrations and Wave Motion	5	6		
Reflection and Refraction of Light	2	3		
Mirrors and Lenses	3	6		
Wave Optics	3	3		
Relativity	3	3		
Quantum Physics and Cosmology	5	3		
*Lab hours are a combination of experiments, demonstrations and problem sessions				
TOTAL	45	45	0	0

EVALUATION							
QUIZZES	☐	EXAMS	☑	ORAL PRES	☐	PAPERS	☐
LAB WORK	☑	PROJECTS	☐	COMP FINAL	☑	OTHER	☑ homework

COURSE MATERIALS		
TITLE:	Physics	
AUTHOR:	James S. Walker	
PUBLISHER:	Prentice Hall	
VOLUME/EDITION/URL:	4th	
COPYRIGHT DATE:	2009	

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:
Electric Charge and Electric Fields	7	· To be able to compute electric forces and fields from simple point charges.
Electrical Potential and Electric	7	· To Demonstrate the distinction between voltage and electric field. To calculate capacitance and equivalent capacitance.
Current and Resistance	9	· To calculate currents and voltages using Ohm's Law. To find equivalent resistance.
Direct Current Circuits	8	· To wire up simple DC circuits. To use Kirchoff's Laws.

Magnetism	7	· To demonstrate properties and behaviors of magnets and magnetic fields.
Induced Voltages and Inductance	6	· To demonstrate Faraday's Law and work quantitative problems.
Vibrations and wave motion	13	· To demonstrate wave motion from the dynamics and energy points of view.
Physical optics	11	· To demonstrate and calculate refraction and also characterize image formation from a variety of optical mediums, such as glass, lenses and mirrors.
Wave Optics	6	· To demonstrate wave interference and diffraction, resolution and polarization and to do simple formula driven calculations of phenomena.
Modern Physics	15	· To obtain a qualitative understanding of special relativity, general relativity and quantum mechanics.
	89	

COURSE OUTCOMES*	At the successful completion of this course, students will be able to:
	• demonstrate simple circuits (Ohm's Law, Kirchoff's Laws) as well as the way circuit elements like resistors and capacitors work.
	• Compute an equivalent capacitance and equivalent resistance.
	• Analyze and apply the 'Ed' rule for electric fields and voltage.
	• Explain how a charged particle moves in an electric and/or magnetic field and how an electric and/or magnetic field is created and apply the principles in problems.
	• Demonstrate the basic operation of an electric motor and an electric generator.
	• Demonstrate traveling waves and standing waves, the latter as they relate to waves on a string and to air columns. (To be able to calculations and draw appropriate pictures of wave resonance patterns.)
	• Demonstrate the concepts of sound intensity, sound intensity level, and the Doppler Effect.
	• Utilize Snell's Law, Lenses, and Mirrors to predict and demonstrate light ray behavior.
	• Demonstrate single and double slit interference and diffraction.
	• Qualitatively understand Special Relativity and the meaning and importance of the postulates of Special Relativity.
	• Qualitatively understand and apply the laws of Quantum Physics, with emphasis on the historical development of Planck's Law, Photoelectric Effect, Compton Effect, the Heisenberg Uncertainty Principle.

** Course Outcomes will be used in the Assessment Software for Outcomes Assessment. Limit to 3 - 5.*