North Central State College

MASTER SYLLABUS
2019-2020

A. Academic Division: Business, Industry and Technology

B. Discipline: Physics

C. Course Number and Title: PHYS1130 – General Physics II

D. Course Coordinator: Gary Wood
Assistant Dean: Toni Johnson, PhD

Instructor Information:
- Name: Click here to enter text.
- Office Location: Click here to enter text.
- Office Hours: Click here to enter text.
- Phone Number: Click here to enter text.
- E-Mail Address Click here to enter text.

E. Credit Hours: 4
Lecture: 3
Laboratory: 3

F. Prerequisites: PHYS1110 (a minimum grade of C- required)

G. Syllabus Effective Date: Fall, 2019

H. Textbook(s) Title:

Physics: Principles with Applications
- Author: Giancoli
- Copyright Year: 2013
- Edition: 7TH
- ISBN #:9780321625922 (Hardcover) or 9780321869111 (Loose-leaf)

I. Workbook(s) and/or Lab Manual: None

J. Course Description: A study of heat to include calorimetry, expansion, heat capacity, conductivity, phase change, kinetic theory and gas laws. A study of light including its nature, and geometric optics. Also a study of electricity and magnetism including electric charges at rest, potentials, capacitance and dielectrics, current, resistance, and voltage, alternating circuits theory of frequency, reactance, impedance, power and resonance, magnetic field definition and effects on moving charges and conductors. This course meets the requirements for TAG# OSC015. If combined with PHYS1110, TAG# OSC021 is met.

K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Calculate the Doppler Shift of sound waves for either the source or observer moving.	Class discussions, homework, labs, quizzes, and exams during the weeks 1-16
2. Solve for indicated variables in problems involving Archimedes' principle or Bernoulli's principle.	Class discussions, homework, labs, quizzes, and exams during the weeks 2-16
3. Solve for the pressure, volume, temperature, mass of gas, or amount of gas in ideal gas law problems.	Class discussions, homework, labs, quizzes, and exams during the weeks 3-16
4. Calculate the thermal expansion and thermal stresses in an object given the material and temperature range.	Class discussions, homework, labs, quizzes, and exams during the weeks 3-16
5. Solve for the indicated variables in calorimetric problems with or without change of phase and involving no more than three materials.	Class discussions, homework, labs, quizzes, and exams during the weeks 4-16
6. Calculate the heat loss due to conduction, convection, or radiation given the temperature of an object and its environment.	Class discussions, homework, labs, quizzes, and exams during the weeks 4-16
7. Calculate the net electric force and potential energy of a test charge and the electric field and electric potential at a point due to a specified array of not more than three point charges at rest.	Class discussions, homework, labs, quizzes, and exams during the weeks 5-16
8. Use conservation of energy to calculate specified electrostatic or kinematic variables due to a specified electric field or charge distribution.	Class discussions, homework, labs, quizzes, and exams during the weeks 6-16
9. Calculate the equivalent capacitance of a specified network of capacitors and the charge on, potential difference across and energy stored by specified capacitors in the network.	Class discussions, homework, labs, quizzes, and exams during the weeks 6-16
10. Calculate current, resistance, electromotive force, power loss, potential difference, and resistivity for specified parts of a direct current circuit.	Class discussions, homework, labs, quizzes, and exams during the weeks 7-16
11. Calculate related current, magnetic force and magnetic flux, induced 12. electromotive force, and torque for magnetic field problems.	Class discussions, homework, labs, quizzes, and exams during the weeks 11-16
13. Calculate the peak current, RMS current, impedance, peak voltage, and RMS voltage for alternating current problems.	Class discussions, homework, labs, quizzes, and exams during the weeks 13-16
14. Calculate the position, size and nature of an image (or object) given a problem in geometrical optics with no more than two optical devices.	Class discussions, homework, labs, quizzes, and exams during the weeks 15-16

Evaluation of the above will be determined by:
1. The appropriate solution formula
2. Correct substitution into said formula
3. The logical consistency of the methods and mathematical steps
4. Correctness of the final numerical result, including proper units

The students will develop the following skills to meet the above outcomes.

1. Use computers as a tool to gather and process data from an experiment.
2. Identify and use the proper units for physical quantities.
3. Interpret and construct graphs and diagrams that describe relationships among physical variables and objects.
4. Interpret formulas by identifying the meaning of constants, describing the conditions for which the formula is valid, and using mathematical relationships to predict how a change in one variable affects the value of another variable.
5. Given a problem, decide what information is missing and what given information is irrelevant. Obtain the missing information and solve the problem.
6. Integrate learning from early units in the course to solve a problem later in the course.
7. Apply appropriate physics concepts to solve problems.
8. Determine whether or not the result of a calculation is reasonable.

M. Topical Timeline (Subject to Change):

1. Sound
2. Fluids
3. Temperature & Kinetic Theory
4. Heat
5. Electric Charge and Electric Field
6. Electric Potential
7. Electric Currents
8. DC Circuits
9. Magnetism
10. Electromagnetic Induction and Faraday's Law
11. Light: Geometric Optics

N. Course Assignments:

Week	Topics (Chapter – Section)	Lab
01	1 Sound 1-1 Characteristics of Sound 1-2 Intensity of Sound: Decibels 1-3 Sources of Sound: Vibrating Strings and Air Columns 1-4 Interference of Sound Waves; Beats 1-5 Doppler Effect	Sound Resonance
02	**2 Fluids** 2-1 Phases of Matter 2-2 Density and Specific Gravity 2-3 Pressure in Fluids 2-4 Atmospheric Pressure and Gauge Pressure 2-5 Pascal's Principle 2-6 Measurement of Pressure; Gauges and the Barometer 2-7 Buoyancy and Archimedes' Principle 2-8 Fluids in Motion; Flow Rate and the Equation of Continuity 2-9 Bernoulli's Equation 2-10 Applications of Bernoulli's Principle	Pascal's Principle

Week	Topics (Chapter – Section)	Lab
03	**3 Temperature & Kinetic Theory** 3-1 Atomic Theory of Matter 3-2 Temperature and Thermometers 3-3 Thermal Equilibrium and the Zeroth Law of Thermodynamics 3-4 Thermal Expansion 3-5 Thermal Stresses 3-6 The Gas Laws and Absolute Temperature 3-7 The Ideal Gas Law 3-8 Problem Solving with the Ideal Gas Law 3-9 Real Gases and Change of Phase	Coefficient of Linear Expansion
04	**4 Heat** 4-1 Heat as Energy Transfer 4-2 Internal Energy 4-3 Specific Heat 4-4 Calorimetry—Solving Problems 4-5 Latent Heat 4-6 Conduction 4-7 Convection 4-8 Radiation	Specific Heat
05	**5 Electric Charge and Electric Field** 5-1 Static Electricity; Electric Charge and Its Conservation 5-2 Electric Charge in the Atom 5-3 Insulators and Conductors 5-4 Induced Charge; the Electroscope 5-5 Coulomb's Law 5-6 Solving Problems Involving Coulomb's Law and Vectors 5-7 The Electric Field 5-8 Field Lines 5-9 Electric Fields and Conductors	Charging by Induction and Conduction
06	**6 Electric Potential** 6-1 Electric Potential Energy and Potential Difference 6-2 Relation Between Electric Potential and Electric Field 6-3 Equipotential Lines 6-4 The Electron Volt, a Unit of Energy 6-5 Electric Potential Due to Point Charges 6-6 Capacitance 6-7 Dielectrics 6-8 Storage of Electric Energy	Capacitance and Dielectrics
07	**7 Electric Currents** 7-1 The Electric Battery 7-2 Electric Current 7-3 Ohm's Law: Resistance and Resistors 7-4 Resistivity	Ohm’s Law & Resistivity
08	**7 Electric Currents** 7-5 Electric Power 7-6 Power in Household Circuits 7-7 Alternating Current	Resistances, Voltages, & Currents in Circuits
09	**8 DC Circuits** 8-1 EMF and Terminal Voltage 8-2 Resistors in Series and in Parallel 8-3 Kirchhoff's Rules 8-4 EMFs in Series and in Parallel; Charging a Battery	Kirchhoff's Rules

Week	Topics (Chapter – Section)	Lab
10	**8 DC Circuits** 8-5 Circuits Containing Capacitors in Series and in Parallel 8-6 RC Circuits—Resistor and Capacitor in Series 8-7 Electric Hazards 8-8 Ammeters and Voltmeters	Capacitors in Circuits
11	**9 Magnetism** 9-1 Magnets and Magnetic Fields 9-2 Electric Currents Produce Magnetic Fields 9-3 Force on an Electric Current in a Magnetic Field 9-4 Force on an Electric Charge Moving in a Magnetic Field 9-5 Magnetic Field Due to a Straight Wire 9-6 Force Between Two Parallel Wires	Force on a current in a Magnetic Field
12	**9 Magnetism** 9-7 Solenoids and Electromagnets 9-8 Torque on a Current Loop; Magnetic Moment 9-9 Applications: Galvanometers, Motors, Loudspeakers	Magnetic Fields In a Coil
13	**10 Electromagnetic Induction and Faraday's Law** 10-1 Induced EMF 10-2 Faraday's Law of Induction; Lenz's Law 10-3 EMF Induced in a Moving Conductor 10-4 Changing Magnetic Flux Produces an Electric Field 10-5 Electric Generators 10-6 Back EMF and Counter Torque; Eddy Currents 10-7 Transformers and Transmission of Power	Electric Motors, Generators, & Transformers
14	**10 Electromagnetic Induction and Faraday's Law** 10-8 Applications of Induction 10-9 Inductance 10-10 Energy stored in a Magnetic Field 10-11 LR Circuit 10-12 AC Circuits and Impedance 10-13 LRC Series AC Circuit 10-14 Resonance in AC Circuits	RLC Circuits
15	**11 Light: Geometric Optics** 11-1 The Ray Model of Light 11-2 Reflection; Image Formation by a Plane Mirror 11-3 Index of Refraction 11-4 Refraction: Snell’s Law 11-5 Total Internal Reflection; Fiber Optics 11-6 Thin Lenses; Ray Tracing 11-7 The Thin Lens Equation; Magnification	Index of Refraction

O. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average

63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

P. Grading and Testing Guidelines:

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Q. Examination Policy:

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R. Class Attendance and Homework Make-Up Policy:

Click here to enter text.

S. Classroom Expectations:

Click here to enter text.

T. College Procedures/Policies:

Important information regarding College Procedures and Policies can be found on the syllabus supplement **located at https://sharept.ncstatecollege.edu/committees/1/curriculum/SiteAssets/SitePages/Home/SYLLABUS%20SUPPLEMENT.pdf**

The information can also be found Choose an item.