DEREE COLLEGE SYLLABUS FOR:

PY 1000 LE INTRODUCTION TO PHYSICS I **3/1½/4**

(Revised Summer 2016)

PREREQUISITES:	None
CATALOG DESCRIPTION:	Fundamental principles, including matter in motion, energy and momentum, solids and fluids, thermal physics and heat.
RATIONALE:	This course fulfils the liberal education requirement of four credits in an experimental science; it is conceptual and non-mathematical. It does not overlap with or duplicate any other course. It gives the student an insight of the physical world based in classical physics. With rapid technological development and our increasing dependence on science and technology, a basic knowledge of fundamental physical phenomena is necessary for an integrated understanding of the world we live in.
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: 1. Build a general background in the science of classical physics and discuss the differences between an experimental science and other disciplines. 2. Develop a knowledge of the relationships between time, displacement, velocity and acceleration, and apply these relationships to problems in everyday one-dimensional and two-dimensional motions. 3. Demonstrate a clear understanding of fundamental laws by Newton and develop the analytical tools required to apply them in a variety of situations. 4. Demonstrate a clear understanding of conservation laws (Conservation of Linear and Angular Momentum, Conservation of Energy Principle) and develop the analytical tools required to apply them in a variety of situations. 5. Examine the development of classical physics and the insight it led to in the study of fluids, heat and temperature; show the ability to apply the relevant concepts in practical examples. 6. Relate and apply the scientific method of work in laboratory activities and assess the effect of experimental uncertainties on lab results.
METHOD OF TEACHING AND LEARNING:	In congruence with the teaching and learning strategy of the college, the following tools are used: • Class lectures, interactive learning (class discussions, group work) video presentations, and practical problems solved in class. • Exercises and analysis of special topics are assigned as homework, and are reviewed in class • Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, see their exam paper, and/or go over lecture/lab material. • Use of a blackboard site, where instructors are free to post course documents, timely announcements, as well as additional resources.
ASSESSMENT:	**Summative:** **Midterm examination** **40%** In-class lab midterm (1/2-hour), 10% In-class midterm examination (2-hour), 30% **Final examination** **60%** In-class lab final (1/2-hour), 10% In-class midterm examination (2-hour), 50% **Formative**: Multiple "diagnostic" tests **0**

	<table><tr><td>Multiple choice/short answers/ matching /long questions /problem solving</td><td>0</td></tr></table> The midterm examination tests Learning Outcomes from 1 to 3. The final examination tests all Learning Outcomes. Lab Examinations test Learning Outcome 6.
INDICATIVE READING:	**REQUIRED READING:** Serway, Vuille. 2015. *College Physics.* 10th edition, Cengage Learning.
INDICATIVE MATERIAL: *(e.g. audiovisual, digital material, etc.)*	**REQUIRED MATERIAL:** Microsoft Office.
COMMUNICATION REQUIREMENTS:	
SOFTWARE REQUIREMENTS:	Microsoft Office.
WWW RESOURCES:	http://saunderscollege.com/physics/college http://krev.com http://physicsworld.com/ http://scienceworld.wolfram.com/physics/ http://arxiv.org/ http://www.physicsclassroom.com/ http://www.physicstoday.org/ http://www.iop.org/ http://phoenix.phys.clemson.edu/tutorials/index.html http://phet.colorado.edu/en/simulations/category/physics http://www.physicslessons.com/iphysics.htm http://surendranath.tripod.com/AppletsJ2.html
INDICATIVE CONTENT:	1. PHYSICS, AN EXPERIMENTAL SCIENCE 2. MOTION IN ONE DIMENSION 3. VECTORS AND TWO-DIMENSIONAL MOTION 4. THE LAWS OF MOTION 5. WORK AND ENERGY 6. MOMENTUM AND COLLISIONS 7. CIRCULAR MOTION AND GRAVITY 8. FLUIDS 9. THERMAL PHYSICS 10. HEAT 11. THERMODYNAMICS **Indicative Lab Activities:** Laboratory experiments will be carried out either through set-up applications or/and computer simulations. Indicative activity titles: 1. Lab Safety and Regulations Communicating Experimental Work (Reports) 2. Experimental uncertainties – Measures of Errors, Graphs, Data Analysis 3. Linear Velocity 4. Vectors – Resultant Force 5. Free Fall – Time Measurement - Reaction Time 6. Projectile Motion 7. Momentum Conservation 8. Simple Pendulum OR Hook's Law 9. Torques 10. The Buoyant Force 11. Expansion-Contraction OR Pressure – Volume Relation of Gases

	12. Heat Capacity of Metals - Specific Heat