PHYS1411 - University Physics I

Credits:	5 (3/2/0)
Description:	Meets MnTC Goal Area 3. This course, which is open to all students but especially suited for engineering students, gives a theoretical and practical introduction to physics for math, science and engineering majors. It is a calculus-based course. Topics include kinetics of one and two dimensions, force and dynamics, bodies in equilibrium, work and energy, linear momentum, rotational motion, fluids, waves and sound. Lab equipment is used to illustrate these concepts. A mastery of college algebra as well as knowledge of calculus and trigonometry is essential for success in this course. The ability to use computers for creating reports and spreadsheets is needed for lab work. Lab is required.
Prerequisites:	• MATH1134
Corequisites:	
Pre/Corequisites*:	
Competencies:	1. Demonstrate an understanding of scientific theories and the scientific method. 2. Demonstrate an understanding of the theories and topics described in the course description. 3. Demonstrate significant proficiency with the use of algebra and trigonometry to manipulate and analyze equations of physics. 4. Create a graph of a data set and then apply appropriate mathematical treatment to measure or compute a result. 5. Demonstrate the ability to express numerical uncertainty in a result and recognize sources of error in measurements. 6. Demonstrate the ability to use dimensional analysis for problem-solving. 7. Communicate effectively by writing detailed solutions to physics problems. 8. Analyze many different physics word problems, translate them to a mathematical form, solve them and communicate the result in writing. 9. Demonstrate an understanding of the hypothesis or physical principal that is measured or illustrated in a lab experiment. 10. Make informed decisions about alternative ways to acquire data. 11. Participate actively with the lab group. 12. Perform diverse experiments and record measurements. 13. Report results of lab experiments with their corresponding errors.
MnTC goal areas:	3. Natural Sciences

**Can be taking as a Prerequisite or Corequisite.*

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