ACADEMIC AFFAIRS

Course Number:	PHYS 332	Department:	Physics
Course Title:	University Physics III	Semester:	Spring Year: 1999

Objectives/Competencies

Course Objective	Competencies
The basic objectives for this course are listed below. Additional objectives may be expected as outlined in the syllabus or presented in other curse material.	The basic competencies for this course are listed below. Additional competencies maybe expected as outlined in the syllabus or presented in other course material.
1. Process Objectives: The process objective of this course is to have students be able to use the mathematics of physics to solve hypothetical problems presented in text form, and to model phenomena measured in laboratory. The topics and Competencies required to meet this objective are listed on the right under "Competencies." These topics are described in detail in standard physics texts.	At the end of this course, students will be able to use the mathematics of physical to solve hypothetical problems presented in text form, and to model phenomena measured in laboratory. Mathematical models of the physical world are listed below: 1. Wave (physical) optics. 2. Maxwell's Equations. 3. Wave Equation. 4. Planck quantization, photoelectric effect. 5. Bohr Atom. 6. Matter waves and the uncertainty principle.
2. Computational Tools for meeting Objectives: Physics students usually need some skill using computational tools	This course assumes that students can use the following tools effectively when they enter this physics course:

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like calculators and computers. This course assumes that students can use computational tools effectively when they enter the course so they can meet the physics course objectives outlined here.	1. Scientific Calculator, trigonometric functions. 2. Scientific Calculator, statistical functions. 3. Scientific Calculator, exponents and logarithms.
3. Mathematics: Physics courses often teach similar subject matter at different levels of sophistication. These levels are most clearly identified by the levels of mathematics used in particular courses. There are two important considerations concerning mathematics: the level of mathematical competency upon entering a physics course, and the mathematical competency added during the course.	In this physics course, students are presumed to be fluent in mathematics at the level of: 1. No mathematical calculations are required. 2. Arithmetic: decimals and fractions. 3. Can use scientific calculator. 4. Algebra: equations, linear graphing. 5. Statistics. 6. Trigonometry: sine, cosine, and tangent. 7. Differential Calculus. 8. Integral Calculus. 9. Linear Algebra. 10. Differential Equations.
4. Mathematics Objectives: An objective of this course is to have students be able to apply several standard mathematical techniques in the solution of physics problems. These competencies are listed on the right under "Competencies."	At the end of this course, students will be able to use several standard mathematics techniques. These topics are described in detail in standard mathematics texts. 1. Differentiate polynomials in problem solving. 2. Differentiate trigonometric functions in problem solving. 3. Integrate polynomials in problem solving. 4. Integrate trigonometric functions in problem solving.

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5. Laboratory Objectives: The objective of the laboratory is to give students hands-on experience with laws of nature and conventions of physics. The laboratory experience emphasized measurement and mathematical modeling. The topics in physics covered in the laboratory generally support topics emphasized in class.	At the end of the laboratory portion of this course, students will be able to: 1. Make measurements and collect data. 2. Organize and present data as tables and graphs. 3. Interpret graphs and statistical data. 4. Interpret graphs and statistical data. 5. Evaluate decay (or growth) curves. 6. Plot data on linear graph paper. 7. Plot data on semi-log graph paper. 8. Mark error bars on graphs of measured data. 9. Plot data on linear graph paper. 10. Relate experimental data to mathematical models. 11. Design experiments. 12. Work in teams. 13. Prepare a Lab Report.