		Course Name/Section Number	
Program Name: Physics	**Objective**	**PHY 131/201**	**PHY 132/202**
Outcome #1	Students will use mathematical models as a medium for quantitative reasoning and describing physical reality	Students will solve problems using: **algebraic models of:** motion (speed, velocity, acceleration), force, work and energy (kinetic, thermal, gravitational potential, elastic potential), momentum (linear, rotational), temperature, thermal expansion, phase change, oscillations, waves. **vector models of:** velocity, acceleration, force, momentum, gravitational fields.	Students will solve problems using: mathematical models used in PHY 131/201 plus: **algebraic models of:** electrostatic force and energy, electric circuits, voltage, current, drift speed, electromagnetic induction, and waves, optics (reflection, refraction, image formation, interference, diffraction), photoelectric effect, duality of light and particles, radioactivity and decay, nuclear reactions, and the relativity of time, mass, and distance v**ector/phasor model of**: electric fields, electrical reactance, and AC current/voltage **statistical model of** nuclear decay
Outcome #2	Students will use graphical models to analyze laboratory data.	Students will make graphs and solve problems using: **linear** graphing—use of slope and intercepts. **logarithmic graphing**---use of slope.	Students will make graphs and solve problems using: **graphing models** used in PHY 131/201 plus: **semilogarithmic graphing**—use of slope
Outcome #3	Students will use the classical conservation laws as a basis of deriving and understanding physics principles.	Students will solve problems using the laws of conservation of **energy** and **linear momentum** to solve problems.	Students will solve problems using the laws of conservation of **energy**, **linear momentum**, and **electric charge** to solve problems.
Outcome #4	Students will communicate physics concepts	Students will write lab reports and answer short essay questions.	Students will write lab reports and answer short essay questions.
Outcome #5	Students will solve problems collaboratively	Students will work in laboratory groups.	Students will work in laboratory groups.
Outcome #6	Information literacy: Students will use software to analyze physics experiments	Students will use software to complete lab data sheets and to write lab reports.	Students will use software to complete lab data sheets and to write lab reports.

		Course Name/Section Number		
Program Name: Physics	**Objective**	**PHY 203**	**PHY 204**	**PHY 205**
Outcome #1	Students will use mathematical models as a medium for quantitative reasoning and describing physical reality	Students will solve problems using: **algebraic models of:** motion (speed, velocity, acceleration), force, work and energy (kinetic, thermal, gravitational potential, elastic potential), momentum (linear, rotational), temperature, thermal expansion, phase change, oscillations, waves. **vector models of:** velocity, acceleration, force, momentum, gravitational fields. **calculus based models of**: velocity, acceleration, force, momentum, work, potential energy (gravitational and elastic) **statistical model of** thermal motion.	Students will solve problems using: mathematical models used in PHY203 plus: **algebraic models of**: electrostatic force and energy, electric circuits, voltage, current, drift speed, electromagnetic forces and waves, optics (reflection, refraction, image formation, interference, diffraction), photoelectric effect, duality of light and particles, **vector/phasor model of**: electric fields, magnetic fields, electrical reactance, AC current/voltage, interference **calculus based models of:** electric fields, electromagnetic induction, magnetic fields	Students will solve problems using:mathematical models used in PHY203 and PHY204 plus: **algebraic models of**: electromagnetic waves, radioactivity, nuclear decay, nuclear reactions, relativity of time, mass, distance, momentum, **statistical/quantum/ wavefunction models of**: atoms, semiconductors
Outcome #2	Students will use graphical models to analyze laboratory data.	Students will make graphs and solve problems using: **linear** graphing—uuse of slope (derivative), intercepts, area (integral), and relative-maximum/minimum/point of inflection. **logarithmic graphing**---use of slope.	Students will make graphs and solve problems using: **graphing models** used in PHY203 plus: **semilogarithmic graphing**—use of slope	Students will solve problems using: **graphing models** used in PHY203/204
Outcome #3	Students will use the classical conservation laws as a basis of deriving and understanding physics principles.	Students will solve problems using the laws of conservation of **energy**, **linear momentum**, and **angular momentum** to solve problems.	Students will solve problems using the laws of conservation of **energy**, **linear momentum**, **angular momentum**, and **electric charge** to solve problems.	Students will solve problems using the laws of conservation of **energy**, **linear momentum**, **angular momentum**, and **electric charge** to solve problems.
Outcome #4	Students will communicate physics concepts	Students will write lab reports and answer short essay questions.	Students will write lab reports and answer short essay questions.	Students will answer essay questions.
Outcome #5	Students will solve problems collaboratively	Students will work in laboratory groups.	Students will work in laboratory groups.	Students will study, solve problems and review course work as a group.
Outcome #6	Information literacy: Students will use software to analyze physics experiments	Students will use software to complete lab data sheets and to write lab reports.	Students will use software to complete lab data sheets and to write lab reports.	