PHYSICS (PHYS)

PHYS 1090 - Interactive Learning Seminar
1 Credit
The course offers interactive problem solving for PHYS-1610. Emphasizes organized approaches and use of mathematical techniques, including calculus, to solve a wide range of problems in mechanics. Topics include static equilibrium, applications of Newton's laws and conservation principles, rotational dynamics, and fluids.
Corequisite(s): PHYS 1610,PHYS 1620

PHYS 1110 - Introduction to Physics
1 Credit
A broad survey of physics. Introduction to contemporary topics in physics and what research is available in physics at Saint Louis University. Students will also meet the current faculty in the Department of Physics. Open to all majors.
Attributes: Natural Science Req (A&S)

PHYS 1130 - Introduction to Astronomy
1 or 3 Credits
Modern concepts of the physical nature of the astronomical universe. Fulfills three credit hours of the general science requirement. For non-science majors; does not apply toward the area of concentration with a major in physics.
Prerequisite(s): (1 Course from MATH 1200-4999, Math Waiver per Advisor with a minimum score of 1200, or SLU Math Placement with a minimum score of 1400)
Attributes: Natural Science Req (A&S)

PHYS 1220 - General Physics I
3 Credits
Lectures, demonstrations, and laboratory in mechanics and heat. (Offered every Fall)
Corequisite(s): PHYS 1235
Restrictions:
Enrollment limited to students in the Doisy College Health Sciences college.

Attributes: Natural Science Req (A&S)

PHYS 1235 - General Physics I Lab
1 Credit
Should be taken concurrently with PHYS 1220. Laboratory topics on mechanics principles of motion, force, energy and waves.
Corequisite(s): PHYS 1220
Attributes: Natural Science Req (A&S)

PHYS 1240 - General Physics II
3 Credits
Lectures, demonstrations and laboratory in electricity, magnetism, wave motion, sound, optics and modern physics. (Offered every Spring)
Prerequisite(s): (PHYS 1220, PHYS 1310, PHYS 1330, or PHYS 1240)
Corequisite(s): PHYS 1255
Restrictions:
Enrollment limited to students in the Doisy College Health Sciences college.

Attributes: Natural Science Req (A&S)

PHYS 1255 - General Physics II Lab
1 Credit
Should be taken concurrently with PHYS 1240. Laboratory on electricity and magnetism principles of fields, circuits and light.
Corequisite(s): PHYS 1240

PHYS 1310 - College Physics I
3 Credits
Lectures and demonstrations in mechanics and heat.
Prerequisite(s): (MATH 1200, 1 Course from MATH 1410-4999, MATH 1400, or SLU Math Placement with a minimum score of 1400); PHYS 1320*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S), UUC:Natural & Applied Science

PHYS 1320 - College Physics I Laboratory
1 Credit
Laboratory in mechanics and heat.
Prerequisite(s): PHYS 1310*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 1330 - College Physics II
3 Credits
Lectures and demonstrations in electricity, magnetism, wave motion, sound, optics and modern physics. (Offered every Spring)
Prerequisite(s): (PHYS 1310 or PHYS 1610)
Attributes: Natural Science Req (A&S)

PHYS 1340 - College Physics II Laboratory
1 Credit
Laboratory in electricity, magnetism, wave motion, sound, optics and modern physics. (Offered every Spring)
Prerequisite(s): PHYS 1310; PHYS 1320; PHYS 1330*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 1610 - University Physics I
3 Credits
Calculus and vector approaches to study of kinematics, statics and dynamics; work and energy; impulse and momentum; circular motion and gravity; rotational motion and equilibrium; vibrations, waves and sound; heat; fluid mechanics; elasticity.
Prerequisite(s): (MATH 1510* with a grade of C- or higher, MATH 1520* with a grade of C- or higher, or SLU Math Placement with a minimum score of 1510); PHYS 1620*

* Concurrent enrollment allowed.
Attributes: UUC:Natural & Applied Science

PHYS 1620 - University Physics I Laboratory
1 Credit
Laboratory experiments to illustrate and supplement material in PHYS 1610. (Offered every Fall and Spring)
Prerequisite(s): PHYS 1610*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 1630 - University Physics II
3 Credits
Calculus and vector approaches to study of electric charges, forces, fields and potentials; electric current; magnetic forces and fields; electromagnetic waves; light and geometrical optics; mirrors and lenses. (Offered every Fall and Spring)
Prerequisite(s): PHYS 1610; PHYS 1620; PHYS 1640*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 1640 - University Physics II Laboratory
1 Credit
Laboratory experiments to illustrate and supplement material in PHYS 1630. (Offered every Fall and Spring)
Prerequisite(s): PHYS 1610; PHYS 1620; PHYS 1630*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 2610 - Modern Physics
3 Credits
Lectures three hours per week. At the level of Beiser's Concepts of Modern Physics. (Offered every Spring)
Prerequisite(s): PHYS 1630
Attributes: Natural Science Req (A&S)

PHYS 2620 - Modern Physics Lab
1 Credit
(Offered every Fall)
Prerequisite(s): PHYS 2610*; (Math Waiver per Advisor with a minimum score of 1520 or 1 Course from MATH 1520-4999)

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 2930 - Special Topics
1-4 Credits (Repeatable for credit)

PHYS 2980 - Independent Study
1-3 Credits (Repeatable for credit)
Attributes: Natural Science Req (A&S)

PHYS 3110 - Classical Mechanics
3 Credits
The elementary theory of the statics, kinematics and dynamics of particles and rigid bodies. At the level of Symon's Mechanics.
Prerequisite(s): MATH 2530
Attributes: Natural Science Req (A&S)

PHYS 3310 - Optics
3 Credits
Lectures and demonstrations three hours per week. Physical and geometrical optics.
Attributes: Natural Science Req (A&S)

PHYS 3320 - Optics Laboratory
1 Credit
The fundamental experiments of modern optics are repeated in this course. Three hours per week.
Corequisite(s): PHYS 3310
Attributes: Natural Science Req (A&S)

PHYS 3410 - Thermodynamics and Statistical Mechanics
3 Credits
At the level of Schroeder's Thermal Physics.
Prerequisite(s): MATH 3550* and PHYS 1630

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 3510 - Analog & Digital Electronics
0 or 3 Credits
Lecture-laboratory six hours per week. Fundamentals of digital circuits with applications to computers. Operational amplifiers. Interfacing of computers with experimental equipment for data collection and control.
Prerequisite(s): PHYS 3511*

* Concurrent enrollment allowed.
Corequisite(s): PHYS 3511
Attributes: Natural Science Req (A&S)

PHYS 3511 - Analog & Digital Electronics Lab
1 Credit
This is laboratory component of the Analog & Digital Electronics course. It is designed to give practical experience with building, debugging, and testing analog and digital circuits, including micro-controller-operated circuits, power regulation, operational amplifiers, etc.
Prerequisite(s): PHYS 3510*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S)

PHYS 3610 - Atomic, Molecular and Solid-State Physics
3 Credits
This course will provide an upper level introduction to topics in Modern Physics including Atomic Physics, Statistical Physics, Molecular Physics, Solid State Physics, Nuclear Physics, Elementary particle Physics, Astrophysics, and Cosmology.
Attributes: Natural Science Req (A&S)

PHYS 3860 - Physics Research I
0 Credits (Repeatable for credit)
First of three course sequence required for B.S. degree in Physics.
Attributes: Natural Science Req (A&S)

PHYS 3930 - Special Topics
3 Credits (Repeatable for credit)

PHYS 3980 - Independent Study
1-3 Credits (Repeatable for credit)
Attributes: Natural Science Req (A&S)

PHYS 4010 - Nanoscience Frontiers
3 Credits
The Nanoscale Science and Nanotechnology applications have become increasingly important for industry and manufacturing. This interdisciplinary physics course is designed to introduce concepts and take a detailed look at how to study, understand and present interdisciplinary science that has significant experimental design components. This course will be devoted to several topics such as Nanoscale Physics, Nanomaterials Engineering, Nanofabrication and Nanolithography.
Prerequisite(s): CHEM 1110 with a grade of C or higher; Minimum Earned Credits of 60; PHYS 1630 with a grade of C or higher; CORE 1000; CORE 1500*

* Concurrent enrollment allowed.
Attributes: Natural Science Req (A&S), UUC:Collaborative Inquiry

PHYS 4110 - Intro to Biophysics
3 Credits
This course covers the basic concepts in biophysics at the fluid, cellular, macromolecular, and molecular levels, including diffusion processes, self-assembly, cooperative transitions, ion pumping, basic ideas of molecular machines, and passage of action potentials in neurons.
Prerequisite(s): PHYS 3410
Attributes: Natural Science Req (A&S)

PHYS 4210 - Electricity & Magnetism I
3 Credits
Lecture three hours per week. At the level of Griffiths, Introduction to Electrodynamics. (Offered every Spring)
Prerequisite(s): MATH 3550
Attributes: Natural Science Req (A&S)

PHYS 4610 - Quantum Mechanics
3 Credits
At the level of Griffiths, Introduction to the Quantum Mechanics.
Prerequisite(s): PHYS 2610; PHYS 3110
Attributes: Natural Science Req (A&S)

PHYS 4840 - Senior Inquiry: Thesis
0 Credits
Attributes: Natural Science Req (A&S)

PHYS 4870 - Physics Research II
0 Credits (Repeatable for credit)
Second of three course sequence required for B.S. degree in Physics.
Attributes: Natural Science Req (A&S)

PHYS 4880 - Senior Inquiry: Research Project
3 Credits (Repeatable for credit)
Third of three course sequence required for B.S. degree in Physics (3 Cr), or satisfies senior inquiry requirement for B.A. degree in Physics (0-3 Cr).
Attributes: Natural Science Req (A&S)

PHYS 4890 - Senior Inquiry: Comprehensive Examination
0 Credits
Attributes: Natural Science Req (A&S)

PHYS 4930 - Special Topics
3 Credits (Repeatable for credit)
Attributes: Natural Science Req (A&S)

PHYS 4980 - Advanced Independent Study
1-6 Credits (Repeatable for credit)
Prior permission of sponsoring professor and chairperson required.
Attributes: Natural Science Req (A&S)

PHYS 5010 - Nanoscience and Nanofabrication Frontiers
3 Credits
Nanoscale Science and Nanotechnology applications have become increasingly important for industry and manufacturing. This course is designed to introduce concepts and take a detailed look at how to study, understand and present interdisciplinary science. The course will be devoted to several topics in Nanoscale physics, Nanochemistry, Nanomaterials, Nanofabrication and Nanolithography.
Attributes: BME Graduate Elective

PHYS 5310 - Introduction in Optics
3 Credits
This course will provide an upper level introduction to the concepts and techniques of modern optics, including: Review of ray optics and optical properties of lenses; Wave properties of light; Wave interference (including beats); Interference from two discrete sources of light; Interference from N discrete sources of light; Diffraction of light passing through apertures and past obstacles (plugs); Quantum nature of light (including photon counting); Laser physics. (Offered every Spring)

PHYS 5930 - Special Topics
3 Credits (Repeatable for credit)

PHYS 5980 - Graduate Independent Study in Physics
1 or 3 Credits (Repeatable for credit)