

PHSX - Physics

PHSX 205. College Physics I. 4 Credits. (3 Lec, 1 Lab) F,S,Su

PREREQUISITE: High school trigonometry or M 121Q or (Math Level 4 or Higher). First semester of sequence. Topics include kinematics and dynamics of linear and rotational motion; work and energy; impulse and momentum; and fluids. Students will not receive credit if they have passed PHSX 220 or PHSX 240. Common exams.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10388	004	First Half Session	TR	AJMJI137	2:30pm - 4:20pm
2020 Summer Semester	10246	001	First Half Session	MTWRF	BARNAR103	8:30am - 9:50am
2020 Summer Semester	10247	002	First Half Session	TR	AJMJI137	10:30am - 12:20pm
2020 Summer Semester	10248	003	First Half Session	TR	AJMJI147	12:30pm - 2:20pm

PHSX 207. College Physics II. 4 Credits. (3 Lec, 1 Lab) F,S,Su

PREREQUISITE: PHSX 205 or PHSX 220 or PHSX 240. Second semester of sequence. Topics include simple harmonic motion; electric forces and fields; dc electric circuits; magnetic forces and fields; and magnetic induction and motors. Students will not receive credit if they have passed PHSX 222 or PHSX 242. Common exams.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10403	003	Second Half Session	TR	AJMJI147	12:30pm - 2:20pm
2020 Summer Semester	11024	004	Second Half Session	TR	AJMJI137	2:30pm - 4:20pm
2020 Summer Semester	10249	001	Second Half Session	MTWRF	BARNAR103	8:30am - 9:50am
2020 Summer Semester	10250	002	Second Half Session	TR	AJMJI137	10:30am - 12:20pm

PHSX 220. Physics I with Calculus. 4 Credits. (3 Lec, 1 Lab) F,S,Su

COREQUISITE: M 171Q or M 181Q. First semester of a three-semester sequence primarily for engineering and physical science students. Covers topics in mechanics (such as motion, Newton's laws, conservation laws, work, energy, systems of particles, and rotational motion) and in mechanical waves (such as oscillations, wave motion, sound, and superposition). Common exams. 201970.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11022	004	Second Half Session	MW	AJMJI138	2:00pm - 3:50pm
2020 Summer Semester	10724	001	First Half Session	TR	BARNAR108	8:30am - 9:50am
2020 Summer Semester	10725	002	First Half Session	MW	AJMJI138	10:00am - 11:50am
2020 Summer Semester	11303	003	First Half Session	MW	AJMJI138	12:00pm - 1:50pm

PHSX 222. Physics II with Calculus. 4 Credits. (3 Lec, 1 Lab) F,S,Su

PREREQUISITE: PHSX 220 or PHSX 240; M 171Q or M 181Q. COREQUISITE: M 172Q or M 182Q. Covers topics in electricity and magnetism (such as Coulomb's law, Gauss' law, electric fields, electric potential, dc circuits, magnetic fields, Faraday's law, ac circuits, and Maxwell's equations) and optics (such as light, geometrical optics, and physical optics). Common exams.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11023	004	June-start: 4x4	MWR	AJMJI	2:00pm - 3:50pm
2020 Summer Semester	10726	001	Second Half Session	MTWRF	BARNAR108	8:30am - 9:50am
2020 Summer Semester	10727	002	Second Half Session	MW	AJMJI	10:00am - 11:50am
2020 Summer Semester	10728	003	June-start: 4x4	MTW	AJMJI146	12:00pm - 1:50pm

PHSX 224. Physics III. 4 Credits. (3 Lec, 1 Lab) F,Su

PREREQUISITE: PHSX 222 or PHSX 242; M 172Q or M 182Q. Covers topics in thermodynamics (such as temperature, heat, laws of thermodynamics, and the kinetic theory of gases) and modern physics (such as relativity; models of the atom; quantum mechanics; and atomic, molecular, solid state, nuclear, and particle physics).

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10968	003	July-start: 4x4	-	-	-
2020 Summer Semester	10729	001	July-start: 4x4	-	-	-
2020 Summer Semester	10730	002	July-start: 4x4	-	-	-

PHSX 401. Physics by Inquiry I. 3 Credits. (3 Lab) Su

PREREQUISITE: Teacher Certification. An in-depth and hands-on exploration of basic physics principles. Scientific model building and proportional reasoning skills will be developed in the context of dc electric, one and two dimensional kinematics, and dynamics. For middle school and high school science teachers.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10839	001	Non-standard term dates 06-JUL-20 17-JUL-20	-	-	-

PHSX 402. Physics by Inquiry II. 3 Credits. (3 Lab) Su

PREREQUISITE: PHSX 401. An in-depth and hands-on exploration of basic physics principles. Scientific model building and proportional reasoning skills will be developed in the context of light, color, geometrical optics, heat, and temperature. For middle school and high school teachers.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11168	001	Non-standard term dates 06-JUL-20 17-JUL-20	-	-	-

PHSX 497. Conceptual Physics for Teachers. 3 Credits. (3 Lec) Su

PREREQUISITES: Since the course is intended for teachers, most participants will have graduate standing, however, some pre-service teachers and other science educators may also take the course as seniors in an undergraduate program. This course is designed for teachers who are covering some of the basic ideas of physics in their classrooms. At the conceptual level, the course describes the world around us. The everyday: how a ball moves when it is thrown, the forces you feel on a roller-coaster, what happens when you turn on a light switch; and the esoteric: time and space from the perspective of Einstein's relativity, atoms and nuclei. Conceptual Physics includes the topics of motion, force, energy, electricity, magnetism, waves, light, and the intriguing concepts of modern physics - relativity, atoms, and nuclei.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11243	801	Intersession	-	ONLINEWEB-	

PHSX 511. Astronomy for Teachers. 3 Credits. (3 Rct) F,S,Su

PREREQUISITE: Graduate standing; Currently certified middle and high school teachers with one year of teaching experience. This is an online, distance education course primarily intended for science educators. Topics include: the laws of gravity and orbital dynamics, a survey of the solar system, stars and stellar evolution, galaxies, and Big Bang cosmology.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10718	801	Full Semester	-	ONLINEWEB-	

PHSX 513. Quantum Mechanics Online. 3 Credits. (3 Lec) Su alternate years, to be offered even years.

PREREQUISITE: Graduate standing; Currently certified high school teachers with one year of teaching experience; an introductory physics course; and a working knowledge of elementary differential and integral calculus. This online course addresses the key ideas behind quantum mechanical observations and devices, including the fundamental behavior of electrons and photons. Designed for practicing high school physics teachers. Assignments and discussions use electronic computer conferencing and simulation software.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10221	801	Full Semester	-	ONLINEWEB-	

PHSX 571. Electric Circuits and Magnetism for Teachers. 2 Credits. (2 Lec) Su
PREREQUISITE: Graduate standing; science educator; interest in science. This 2-credit graduate course is designed for practicing teachers who are teaching or plan to teach electricity and magnetism as part of the science curricula in their classrooms. Its broad purpose is to introduce core concepts in electric circuits and magnetism. The course aims to help teachers by increasing their understanding of the underlying physics so that they may use their curricular materials more effectively.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11163	801	Intersession	-	ONLINEWEB-	

PHSX 574. World of Motion for Teachers. 1 Credit. (1 Lec) Su
PREREQUISITE: Graduate standing; science educator; interest in science. In this 6-week course for teachers we will focus on the core ideas of measurement and motion, as they appear in modern inquiry-oriented science education. The course aims to help teachers use modern curricular materials more effectively by increasing their understanding of the physics concepts.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11164	801	First Half Session	-	ONLINEWEB-	

PHSX 576. World of Force for Teachers. 1 Credit. (1 Lec) Su
PREREQUISITE: Graduate standing; science educator; interest in science. This 1-credit course is designed for teachers who are exploring the concepts of forces in their classrooms. Its broad purpose is to introduce elementary and middle school teachers to core ideas about forces, as they relate to modern, inquiry-oriented science curricular materials. The course aims to help teachers use such materials more effectively by increasing their understanding of physics concepts. It is not a course in how to use a particular curriculum.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11165	801	Second Half Session	-	ONLINEWEB-	

PHSX 585. Physics by Inquiry: Electric Circuits. 3 Credits. (1 Lec, 2 Lab) Su
PREREQUISITE: A minimum of 2 years teaching experience and Teacher Certification. An in-depth and hands-on exploration of basic physics principles. Scientific model building and proportional reasoning skills will be developed in the context of dc electric circuits and phases of the moon. For middle school and high school science teachers.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11420	001	Non-standard term dates 06-JUL-20 17-JUL-20	MTWRF	AJM147	8:00am - 5:00pm

PHSX 586. Physics by Inquiry: Heat & Temperature. 3 Credits. (1 Lec, 2 Lab) Su
PREREQUISITE: A minimum of 2 years teaching experience, and Teacher Certification. An in-depth and hands-on exploration of basic physics principles. Scientific model building and proportional reasoning skills will be developed in the context of light, color, heat, and temperature. For middle school and high school teachers. **PREREQUISITE:** Teacher Certification.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11421	001	Non-standard term dates 06-JUL-20 17-JUL-20	MTWRF	-	8:00am - 5:00pm

PHSX 587. Physic by Inquiry: Optics. 3 Credits. (3 Lab) Su
PREREQUISITE: A minimum of 2 years teaching experience, and Teacher Certification. An in-depth and hands-on exploration of basic physics principles. The course will begin with a careful investigation of geometrical optics, leading to an understanding of pinhole cameras, lenses, and prisms. This will be followed by an exploration of magnetic interactions and magnetic materials. For middle school and high school science teachers.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11422	001	Full Semester	MTWRF	AJM1H	8:00am - 5:00pm

PHSX 591. Special Topics. 1-4 Credits. (1 Lec; 12 cr max) On Demand
 Max 12 cr. **PREREQUISITE:** Upper division courses and others as determined for each offering. Courses not required in any curriculum for which there is a particular one time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	10717	801	Non-standard term dates 08-JUN-20 24-JUL-20	-	-	-

PHSX 594. Seminar. 1 Credit. (1 Sem; 8 cr max) On Demand
 Max 8 cr. **PREREQUISITE:** Graduate standing or seniors by petition. Course prerequisites as determined for each offering. Topics offered at the graduate level which are not covered in regular courses. Students participate in preparing and presenting discussion material.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11229	001	May-start: 4x4	-	-	-
2020 Summer Semester	11230	002	June-start: 4x4	-	-	-
2020 Summer Semester	11231	003	July-start: 4x4	-	-	-

PHSX 595. Teaching Mechanics Using Research-based Curriculum. 2 Credits. (1 Lec, 1 Lab) Su

PREREQUISITES: Teacher of science with a minimum of two years teaching experience. This course prepares participants to teach a mechanics course built around Tutorials in Introductory Physics (McDermott, et al.). This research-based curriculum was designed to be used in recitations to augment traditional lecture courses operating essentially independent of the lecture. The course will model both the student-centered tutorial instruction and the supporting active-engagement lectures for a selection of topics from the first semester of the two-semester sequence.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11358	001	Non-standard term dates 22-JUN-20 26-JUN-20	MTWRF	AJM1H	8:00am - 5:00pm

PHSX 596. Teaching Electricity & Magnetism for Teachers. 2 Credits. (1 Lec, 1 Lab) Su

Participants will learn how to teach an integrated course built around Tutorials in Introductory Physics (McDermott, et al.). This research-based curriculum challenges students to confront their misconceptions and build gut-level models of the key concepts of electricity and magnetism. The course will showcase both the student-centered tutorial instruction and the supporting active-engagement PowerPoint lectures. We will also review the physics education research literature that provides the foundation for these curricular materials.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11167	001	Non-standard term dates 15-JUN-20 26-JUN-20	-	-	-

PHSX 597. Physics of Renewable Energy for Teachers. 3 Credits. (2 Lec, 1 Rct) Su

PREREQUISITE: A minimum of 2 years science teaching experience. Renewable energy sources, such as wind, nuclear and solar, are rich in introductory physics concepts. During this online course, participants will complete a series of units centered on bringing the physics of renewable energy sources into a high school physics classroom. Course time will be devoted to creating classroom materials appropriate for secondary science classrooms which are consistent with Next Generation Science Standards. Energy sources covered will include power derived from fossil fuels, solar, wind, nuclear, geothermal, hydro, biomass and water waves. World energy consumption, sustainability, energy storage and end users will also be covered.

Term	CRN	Section	Session/Dates	Days	Location	Time
2020 Summer Semester	11415	801	Non-standard term dates 08-JUN-20 31-JUL-20	-	ONLINEWEB-	

Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.