Progressive Science Initiative® (PSI®) Course Catalog

Physics Content Courses

PHYS-6601 **6 credits**

Learning and Teaching PSI Algebra-Based Physics

This introductory course is for teachers to learn the content of *PSI Algebra-Based Physics* and how to teach that course to students. The student course is for students who are concurrently enrolled in Algebra. This is a mathematically rigorous physics course that reinforces student knowledge of algebra in one dimension while providing the foundation for studying advanced physics, chemistry and biology. Topics include mechanics, electricity and magnetism, waves and modern physics.

PHYS-6603 **5 credits**

Learning and Teaching PSI Advanced Physics I

This course is for teachers to learn topics from *Advanced Placement Physics 1* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Algebra-Based Physics*. Topics include vector analysis, kinematics in two dimensions, dynamics in two dimensions, Newtonian gravitation, rotational motion, conservation of energy and momentum, and waves.

Prerequisite: PHYS-6601

PHYS-6605 **6 credits**

Learning and Teaching PSI Advanced Physics II

This course is for teachers to learn topics from *Advanced Placement Physics 2* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Algebra-Based Physics*. Topics include two-dimensional electric force and field, electric potential and capacitors, magnetism and electromagnetic induction and geometric optics.

Prerequisite: PHYS-6603

PHYS-6607 **5 credits**

Learning and Teaching PSI Physics – Capstone Course

This course is for teachers to learn further topics from *Advanced Placement Physics 2* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Algebra-Based Physics*. This capstone course also serves as a

review of all the content of the Praxis Physics Content Test. Topics include fluids, thermodynamics and modern physics and Physics Praxis Review.

Prerequisite: PHYS-6605

Physics Field Experience Courses

PHYS-6602 **3 credits**

Field Experience in Teaching PSI Physics I

This is the first of two field experience courses in which participating candidates will teach at least one section of PSI Algebra-Based Physics to students. This field experience provides the setting for developing a deeper understanding of the physics content and for practicing the methods and pedagogy. Topics taught during the field experience will include: Mechanics. (A waiver from the NJDOE allows all candidates enrolled in the Physics Endorsement program to teach this course.)

Co-requisite: PHYS-6603

PHYS-6604 **3 credits**

Field Experience in Teaching PSI Physics II

This is the second of two field experience courses in which participating candidates will teach at least one section of PSI Algebra-Based Physics to students. This field experience provides the setting for developing a deeper understanding of the physics content and for practicing the methods and pedagogy. Topics taught during the field experience will include: Electricity and Magnetism, and Waves. (A waiver from the NJDOE allows all candidates enrolled in the Physics Endorsement program to teach this course.)

Co-requisite: PHYS-6605

Chemistry Content Courses

CHEM-6701 **7 credits**

Learning and Teaching PSI Chemistry

This introductory course is for teachers to learn the content of *PSI Chemistry* and how to teach that course to students. The student course is designed to be taught to introductory chemistry students who have taken algebra-based physics prior to this course. This is a mathematically rigorous chemistry course that builds upon foundational topics in physics and leads to a better understanding of biology. Topics include atomic structure, periodic trends, bonding, chemical reactions, stoichiometry, properties of matter and solutions, kinetics and equilibrium and organic compounds.

CHEM-6703 **6 credits**

Learning and Teaching PSI Advanced Chemistry I

This course is for teachers to learn topics from *PSI Advanced Placement Chemistry* and how to teach those topics to students, while providing teachers a greater depth of understanding to

support their teaching of *PSI Chemistry*. Topics include: atomic structure, periodic trends, bonding, stoichiometry and properties of matter and solutions.

Prerequisite: CHEM-6701

CHEM-6705 **6 credits**

Learning and Teaching PSI Advanced Chemistry II

This course is for teachers to learn topics from *PSI Advanced Placement Chemistry* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Chemistry*. Topics include kinetics, equilibrium, thermochemistry, and electrochemistry.

Prerequisite: CHEM-6703

CHEM-6707 **3 credits**

Learning and Teaching PSI Chemistry – Capstone Course

This capstone course is for teachers to learn further topics from the student course *PSI Advanced Placement Chemistry* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Chemistry*. Topics covered in this course include equilibrium, biochemistry and organic chemistry. This capstone course also serves as a review for the Praxis Chemistry Content Test.

Prerequisite: CHEM-6705

Chemistry Field Experience Courses

CHEM-6702 **3 credits**

Field Experience in Teaching PSI Chemistry I

This is the first of two field experience courses in which participating candidates teach at least one section of *PSI Chemistry* to students. This field experience provides the setting for developing a deeper understanding of the physics content and for practicing the methods and pedagogy. Topics taught include Atomic Structure, Periodicity, Chemical Bonding, Mole Calculations, and Chemical Reactions. (A waiver from the NJDOE allows all candidates enrolled in the Physics Endorsement program to teach this course.)

Co-requisite: CHEM-6703

CHEM-6704 **3 credits**

Field Experience in Teaching PSI Chemistry II

This is the second of two field experience courses in which participating candidates teach at least one section of *PSI Chemistry* to students. This field experience provides the setting for developing a deeper understanding of the physics content and for practicing the methods and pedagogy. Topics taught include Stoichiometry, Gases, Intermolecular Forces, Chemical Energy, Matter and Solutions, and Kinetics and Equilibrium. (A waiver from the NJDOE allows all candidates enrolled in the Physics Endorsement program to teach this course.)

Co-requisite: CHEM-6705

Methods Courses

MET-6101 **2 credits**

PSI-PMI Methods and Pedagogy

This course prepares teachers to instruct students using research-proven methods; methods that were initially developed for the Progressive Science Initiative® (PSI®) and are now being successfully extended to other domains. Teachers will learn best practices for curriculum, pedagogy, technology, formative and summative assessment, grading, and pacing and how those are woven together to create a highly effective teaching and learning environment. Specific topics include best practices for brief direct instruction, inquiry, modeling, facilitating group discussion, social constructivism and frequent formative assessment, inquiry-based science labs, mastery-based summative assessment, appropriate use of retakes to encourage persistence and mastery. Instruction will also focus on the use of student polling devices to drive instruction through formative assessment.