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SCIENCE

Biology 101 and 102

2 semesters 1 credit

Prerequisite

None

Fees and Costs

None

Course Overview

All Bio 101: An inquiry (hands-on) approach to understanding cell structure, molecular movement, cell division and DNA structure. Discusses how there are many different compartments that do different jobs in order to keep an internal balance (homeostasis). Also explores how genetic traits are passed on throughout generations.

Honors Bio 101: In addition to the topics in Biology 101 students will explore basic chemistry concepts including atomic theory, atomic structure, and forming and naming compounds (binary and tertiary).

All Bio 102: An inquiry (hands-on) approach to understanding evolution, ecology, taxonomy and classification. Discusses how all organisms change and adapt to their specific environment in order to pass their genes on to their offspring. Explores factors that affect the input and output of ecological systems; including practical applications based on sustainability.

Honors Bio 102: In addition to the topics in Biology 102 students will explore DNA replication and expand on chemistry by introducing stoichiometry.

Text Used

Biology, Miller & Levine, Pearson.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. *Plan and conduct scientific investigations*
2. *Understand cell theory, cell organelles and their functions, and cell division*
3. *Apply genetic principles to solve problems*
4. *Create and interpret scientific models*
5. *Understand inputs and outputs of a variety of biological systems*
6. *Demonstrate the process of change over time*
7. *Develop understanding of sustainability through a practical application project*

****Note:** To fulfill the science requirement students may choose Honors Biology instead of this course

Physical Science Motion

1 Semester .5 Credit

Prerequisite

None

Fees and Costs

None

Course Overview

Explores the areas of motion and forces. Basic algebraic applications will also be included. Much of the instruction is in the form of laboratory activities emphasizing scientific principles, problem solving, and

energy transfers of systems, and practical applications.

Text Used

Conceptual Physics, Paul Hewitt, Prentice Hall.

Student Learning Objectives:

As a result of required instruction the student will be able to:

1. *Describe motion.- using graphs diagrams and data - explain how distance, displacement, speed, velocity and acceleration describe the motion of an object.*
2. *Energy of motion : describe and calculate the KE, PE and TME of an object and how Work can change the motion of an object and the energy present*
3. *Causes of motion - Describe and calculate how balanced and unbalanced forces of friction, tension, weight, gravity and applied forces affect the motion of objects*

Physical Science Energy

1 Semester .5 Credit

Prerequisite

None

Fees and Costs

None

Course Overview

Explores the areas of energy, waves, light, sound, and also topics within electricity and magnetism. Basic algebraic applications will also be included. Much of the instruction is in the form of laboratory activities emphasizing scientific principles, problem solving, and energy transfers of systems, and practical applications.

Text Used

Conceptual Physics, Paul Hewitt, Prentice Hall.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. *Understand the basic properties of mechanical waves.*
2. *Compare and contrast transverse and compression of waves.*
3. *Understand the basic properties of sound waves*
4. *Compare and contrast mechanical and electromagnetic waves.*
5. *Describe the different wavelengths of the Electromagnetic Spectrum*
6. *Understand the basic properties of light.*
7. *Describe the phenomenon of reflection in flat, concave, and convex mirrors.*
8. *Understand basic concepts of refraction of light.*
9. *Describe the refraction of light through concave, and convex lenses.*
10. *Explain the basic principles of magnetism.*
11. *Describe and measure the energies associated with moving electrons causing both magnetism and electricity.*
12. *Identify and use the correct terms and units used to describe electricity.*

CHS Chemistry 301 and 302 (Through the University of Washington)

2 semesters 1 credit

This course meets requirements for Algebra-based Science.

Prerequisite

Grade of B- or better in previous Science classes

Grade of B or better in Algebra I

Fees and Costs

None (Unless students wish to receive college credits)

College Credit

Students who pay the U.W. fees in the fall, and receive a C- (average between the two semesters) or better, will earn 5.0 credits and a P (passing grade) on their U.W. Transcript for the Chem 110 Course. (These credits are also accepted by many other colleges.) Their high school transcript will show the letter grade that was earned.

Course Overview

In this course the basic scientific principles which underline chemical changes are explored. Specifically, we study such topics as atomic structure, the periodicity of atoms, chemical substances and reactions, stoichiometry, molecular structure, phases of matter, gas laws, energy changes, acids and bases, chemical kinetics, and equilibrium. Environmental, industrial and any other practical applications will be dispersed throughout the class. Also, a heavy emphasis is put on math, and laboratory skills.

Text Used

Chemistry, Pearson, 2012.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. Understand the present theory of atomic structure.
2. Understand and apply the information within the periodic table of the elements.
3. Become familiar with naming compounds, writing formulas, writing and balancing equations, and knowing as well as predicting physical and chemical properties of substances.
4. Perform the many mathematical applications in the areas of moles and molecular mass, stoichiometry, gas laws, concentration, graphing, chemical kinetics and thermodynamics, and equilibrium.
5. Safely perform basic chemical laboratory procedures and technique.
6. Understand and apply basic chemical principles to every day types of situations.
7. Communicate in writing, the understanding of the various concepts that are covered.

Physical Science Geology

1 Semester .5 Credit

Prerequisite

None

Fees and Costs

None

Course Overview

This course is designed to explore the fundamental concepts of Earth science and geology. Topics covered include origin and history of the universe, structure and features of galaxies, our solar system, Earth/moon system, Earth's geologic history, Earth's composition, plate tectonics, volcanism, erosion and deposition, minerals, rock types, rock cycle, Pacific Northwest Geology, biogeochemical cycles, Earth's atmosphere, and climate.

Physical Science Chemistry

1 Semester .5 Credit

Prerequisite

None

Fees and Costs
None

Course Overview

This course is designed to introduce the basic concepts of chemistry. Topics covered will include atomic structure, elements and isotopes, physical and chemical properties of matter, phases of matter, types of mixtures, the periodic table and periodic properties, ionic and covalent bonding, molecules and compounds, chemical reactions, chemical equations, chemical formulas and nomenclature, the mole, acids, bases and salts.

Honors

Honors Biology 101 and 102

2 semesters 1 credit

Prerequisite

“B” or better in 8th grade science class, “B” or better in Algebra I.
MSP and MAPS testing Scores

Fees and Costs
None

Course Overview

All Bio 101: An inquiry (hands-on) approach to understanding cell structure, molecular movement, cell division and DNA structure. Discusses how there are many different compartments that do different jobs in order to keep an internal balance (homeostasis). Also explores how genetic traits are passed on throughout generations.

Honors Bio 101: In addition to the topics in Biology 101 students will explore basic chemistry concepts including atomic theory, atomic structure, and forming and naming compounds (binary and tertiary).

All Bio 102: An inquiry (hands-on) approach to understanding evolution, ecology, taxonomy and classification. Discusses how all organisms change and adapt to their specific environment in order to pass their genes on to their offspring. Explores factors that affect the input and output of ecological systems; including practical applications based on sustainability.

Honors Bio 102: In addition to the topics in Biology 102 students will explore DNA replication and expand on chemistry by introducing stoichiometry.

Text Used

Biology, Miller & Levine, Pearson.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. Plan and conduct scientific investigations
2. Understand cell theory, cell organelles and their functions, and cell division
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7. Develop understanding of sustainability through a practical application project

AP Biology 401 and 402

2 semesters 1 credit

This course is offered in rotation with AP Chemistry

Prerequisite

C+ or higher in CHS Chemistry 301 and 302. Alternatively, students may be concurrently enrolled in Chemistry (with approval of the AP Biology instructor only)

Fees and Costs

Students electing to take the AP Biology exam in the spring will be required to pay the test fee

Students may take this course for CWU credit (5 credits for the entire year)

The CWU course is "BIO 101: Fundamentals of Biology"

Costs must be paid to CWU (per credit fee and CWU student registration)

Text Used

Reece, Jane et al., Campbell Biology, 9th Edition. Benjamin Cummings, 2011.

Course Overview

AP Biology is a challenging and rewarding course that provides students an opportunity to experience science as a process and not just a collection of unrelated facts. This course focuses on inquiry-based laboratory work and the use of science practices in both lab and non-lab activities. AP Biology is structured around four big ideas of biology:

1. The process of evolution drives the diversity and unity of life
2. Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis
3. Living systems store, retrieve, transmit, and respond to information essential to life processes
4. Biological systems interact, and these systems and their interactions possess complex properties

AP Chemistry 401 and 402

2 semesters 1 credit

This course meets requirements for Algebra-based Science.

This course is offered in rotation with AP Biology.

Prerequisite

B- or better grades in Math 101/102, Basic Biology, and Chemistry. Chemistry instructor's approval. This course is offered in rotation with AP Biology.

Fees and Costs

If students elect to take it, there is a cost for the national AP exam.

Course Overview

The class will involve in depth studies in the areas of measurement, matter, atomic structure, molecular structure, the periodic table, chemical bonds, stoichiometry, states of matter and their behaviors, gas laws, descriptive chemistry, predicting products, reaction kinetics, equilibrium, thermodynamics, oxidation-reduction, electrochemistry and the chemistry of acids and bases. There will be a heavy emphasis on laboratory work, data collection, data analysis, writing, algebraic manipulation and problem solving.

Text Used

Chemistry, Fourth Edition, Zumdahl, 1997.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. *Plan and conduct scientific investigations.*
2. *Apply chemical principles and mathematical skills to problem solving.*
3. *Clearly communicate through writing, the results of scientific experiments and approaches to problem solving.*
4. *Successfully complete "AP type" testing as a regular part of the course.*
5. *Successfully operate all of the basic and technical equipment used in the course.*
6. *Apply the uses of computers in laboratory situations.*

CHS Environmental Science 401 and 402

2 semesters 1 credit

Prerequisites

C grade or better in College Prep Chemistry 301 and 302 (or instructor permission)

(Additional requirements may exist for CWU Credit)
This course is offered in rotation with CHS Physics

Fees and Costs

Fees are only for students opting to take these courses for CWU credit
These two non-sequential CWU courses (ENST 201, ENST 202 at CWU) are 5 credits each
Costs must be paid to CWU (per credit fee and CWU student registration)

Course Overview

CHS Env Sci 401 (CWU course ENST 201): Introduction to the concept of our planet as a finite environment with certain properties essential for life. The dynamic nature of the earth's physical, chemical, geological, and biological processes and their interrelated "systems" aspects furnishes the thrust of this treatment

CHS Env Sci 402 (CWU course ENST 202): The physical and cultural dimensions of environmental problems with particular emphasis given to the interaction between ecosystems, basic resources, population dynamics, and culture

Text Used

Miller and Spoolman. *Living in the environment*. 17th edition. 2011.

Student Learning Objectives

As a result of required instruction, the student will be able to:

1. Apply a broad understanding of Earth systems to problem solving
2. Cultivate an understanding of environmental challenges through a framework of sustainability
3. Recognize and demonstrate sensitivity to diverse points of view
4. Seek principled solutions to environmental problems
5. Monitor a community's environmental health status using epidemiological tools, laboratory techniques, and field methods appropriate to individual issues
6. Participate in developing and implementing plans and/or policies to improve environmental health using scientific and technical knowledge
7. Communicate effectively with diverse stakeholders individually and in group settings using verbal, written, and electronic modes of communication
8. Describe basic principles of ecology

CHS Physics 411 & 412

2 semesters 1 credit

Meets requirements for Algebra-based Science

Prerequisite:

Grade of B- or better in Basics of Biology 202 and Geometry (Math 201/202)

Fees and Costs:

None

College Credit

Students who pay the C.W.U. fees in the fall, and in the spring, can receive college credit from Central Washington University PHYS 111 and PHYS 112.

Course Description:

This first semester explores the areas of mechanics, which includes velocity, acceleration, Newton's laws, force diagrams, friction, circular motion and simple machines. (CWU's PHYS 111)

While the second semester focuses on forms of energy, which includes electrostatics, electricity, waves, light and sound. (CWU's PHYS 112)

Much of the instruction is in the form of laboratory activities emphasizing scientific principles and problem solving.

Text Used

Holt Physics , Serway / Faughn, 1999.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. Understand and apply the basic principles in the areas of energy, forces and motion.
2. Design and conduct scientific investigations.
3. Perform many mathematical applications and problem solving.
4. Safely perform basic laboratory procedures and technique.
5. Understand and apply basic principles of physics to every day types of situations.

Career and Technical

Anatomy and Physiology 301/302

2 Semesters/1.0 Credit

Prerequisite

Biology (passing grade) and passed EOC for Biology.

Fees and Costs

Possible cost for field trips; will be determined on class by class basis

Course Overview

This course introduces the student to medical, science, and health concepts regarding human anatomy and physiology. The student will learn about the human body systems, diseases and system processes. This class is key for students looking into post secondary education in the field of medicine including, but not limited to: physician, nursing, physical therapy, personal fitness, dental care, medical assisting, and paramedic/fire fighting/emergency medical technician.

This is an introductory course to help students prepare for additional anatomy/physiology courses in college.

Text Used

Essentials of Human Anatomy & Physiology, Marieb 2012.

Student Learning Objectives

As a result of the instruction, the student will be able to:

1. Demonstrate proper use of medical terminology regarding the human body.
2. Understand function of and be able to identify structures related to the 11 human body systems.
3. Demonstrate knowledge of various diseases or conditions that may affect structures and systems within the human body.
4. Demonstrate proper dissection techniques.
5. Apply physiology concepts learn in the classroom to real world medical and healthcare applications/techniques.
6. Explore and research medical, science, and health occupations using various computer programs/internet.
7. Understand patient privacy concepts in the medical/health care workplace.
8. Demonstrate effective work habits and effective communication skills needed in the medical and health care workplace.

Demonstrate 21st century leadership skills in the classroom.

Animal Biology 201 and 202

1 Semester .5 credit (Tech Prep Available- See Below)

Prerequisite:None

Fees and Costs:None

Course Overview: This class introduces students to a survey of genetics, reproductive physiology, growth and development, nutrition and digestive physiology, anatomy, meat science, animal classification, current issues and overviews of the dairy, poultry, equine, beef, sheep, swine, and aquaculture industries.

Opportunity is provided for students to earn 5 credits of tech Prep through Yakima Valley Community College for Intro to Animal Science.

Content may be enhanced by utilizing appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have an agricultural experience program.

Student Learning Objectives:

As a result of required instruction the student will be able to:

1. Understand basic livestock physiology, the application of this physiology, and the industries surrounding each species, as well as the evaluation of live animals.
2. Understand basic cell structure and the various systems within an animal's body.
3. Explain basic concepts of animal behavior, welfare, and skills necessary for anyone working with animals.
4. Examine and identify each species of livestock from breeds to feeding programs to housing and common health concerns.
5. Discuss each species' industry and how they deal with the ever changing biological, economic, and regulatory hurdles.
6. Recognize differences between individual animals, carcasses, and cuts of meat.

Forensic Science 301 & 302

1 semester .5 credit

This course does not meet requirements for Algebra-based Science.

Prerequisite

Junior or Senior Standing

Fees and Costs

None

Course Overview

Forensics is an investigative science and technology course that is lab-based and hands-on. You will explore what forensic scientists do. You will learn modern forensic methods and use scientific methods to solve legal problems.

This course will focus on collection and analysis of crime scene evidence. Students will learn how to observe, collect, analyze and evaluate evidence found at crime scenes. Some of the many topics covered are fingerprint analysis, hair and fiber comparison, DNA fingerprinting, blood spatter and crime scene analysis, toxicology, anthropology, ballistics, impressions, entomology, determining time of death, and psychology (look into minds of serial killers). The culmination of the course will include the creation and analysis of a crime scene.

Text Used

Forensic Science: Fundamentals & Investigations (Chapters 1-17), South-Western CENGAGE Learning, 2009

Student Learning Objectives

As a result of required instruction the student will be able to analyze and understand the basics of forensics as it applies to all of the units outlined above.

Unit 1: Crime Scene and Eyewitness Basics

Unit 2: Power of Evidence

Unit 3: Blood Basics

Unit 4: Forensic Entomology

Unit 5: Fire Science

Unit 6: Crash Science

Advanced Forensics

Pre req: Forensics

This course is a continuation of Forensics I. In this course students will be challenged to apply all the techniques they learned in Forensics I and apply them to more difficult cases. Students will also analyze more types of evidences including impressions, entomology, time of death, anthropology, forgery, ballistics and drug analysis.

Horticultural Science 101

1 Semester .5 credit (Tech Prep Available- See Below)

Prerequisite:None

Fees and Costs:None

Course Overview:

This course is designed to introduce students to areas and concepts involved in Horticulture Science. Students will learn to apply scientific principles and concepts through classroom and hands-on experiments. This course will strengthen the students' knowledge of science and give them a better understanding of the environment, plant growth, plant classification and identification, and the importance of soil. It will also introduce students to the careers and opportunities available in the field of Horticulture.

Opportunity is provided for students to earn 5 credits of tech Prep through Yakima Valley Community College for Introduction to Plant Science.

Content may be enhanced by utilizing appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have an agricultural experience program.

Student Learning Objectives:

As a result of required instruction the student will be able to:

1. Analyze the historical development of horticulture
2. Identify horticultural plants
3. Knowledge of plant parts and their functions
4. Analyze the benefits of plants
5. Understand general plant anatomy

6. Utilize a various skills in plant propagation
7. Analyze plant growth requirements
8. Utilize horticultural practices
9. Grow and market a horticultural crop
10. Identify plant pest and apply pesticides
11. Apply principles of floral design and management

Horticultural Science 102

1 Semester .5 credit (Tech Prep Available- See Below)

Prerequisite:None

Fees and Costs:None

Course Overview:

This course is designed to build upon the content students learned in horticulture 101 and to go more in depth into areas and concepts involved in Horticulture Science. Students will learn to apply scientific principles and concepts through classroom and hands-on experiments. This course will strengthen the students' knowledge of science and give them a better understanding of the environment, plant growth, plant classification and identification, and the importance of soil. It will further discuss the careers and opportunities available in the field of Horticulture.

Opportunity is provided for students to earn 1 credit of tech Prep through Yakima Valley Community College for Introduction to Agriculture.

Content may be enhanced by utilizing appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have an agricultural experience program.

Student Learning Objectives:

As a result of required instruction the student will be able to:

1. Utilize skills in greenhouse management
2. Apply gardening techniques
3. Select and care for house plants and flowers
4. Demonstrate skills in basic floral design page
5. Manage a nursery
6. Demonstrate proper tool and power safety
7. Utilize skills in plastic and metal pipe plumbing
8. Plan a horticultural construction project
9. Demonstrate leadership skills

10. Grow and market a horticultural crop

Sports Therapy 101/102 and 201/202

w/ Lab Practicum (8th Period)

2 semesters 1 credit (.5 optional credit per semester may be earned)

This course does not meet requirements for Algebra-based Science. This course may be used for either a Laboratory Science or an Occupational Education credit.

Prerequisite

Advanced Sports Therapy requires a "C" or better in Introduction to Sports Therapy. Practicum requires current enrollment in Advanced Class or current enrollment in Intro Class with Instructor approval

Fees and Costs

First aid cards certification is available for a fee, but not required.

Texts Used

Essentials of Athletic Injury Management, 6th Edition, Prentice Arnheim 2005

Principles of Athletic Training, 14th Edition, Prentice 2011

Heart Saver First Aid/CPR, American Heart Association

BLS Healthcare professional rescuer, American Heart Association

Course Overview

This career & technical/science course introduces the student to medical, science, and health concepts while combining academic coursework with hands-on practical application skills. The student learns Standard First Aid/ CPR, and Sports Medicine techniques that prepare students for post-secondary education in the medical, science, and health professions, or work in health/fitness professions. *The West Valley Sports Therapy Practicum involves 90 hours of a supervised, clinical lab in the area of Athletic Training working with WVHS athletes and/or clinical outreach in the area of Physical Therapy.

Student Learning Objectives

As a result of required instruction the student will be able to:

1. *Demonstrate Standard First Aid/ CPR skills/Adult AED and utilize universal precaution procedures in relation to Blood Borne Pathogens.*
2. *Understand the importance of injury prevention, proper emergency care, acute treatment, and medical referral of the injured.*
3. *Understand, demonstrate, and evaluate various taping/bracing/wrapping techniques and apply in a sports setting.*
4. *Understand and demonstrate the concept of injury evaluation, injury rehabilitation and treatment.*
5. *Understand nutrition concepts, design nutrition plans for a specific need/activity/population*
6. *Explore and research medical, science, and health occupations using various computer programs/internet.*
7. *Demonstrate appropriate workplace ethics in a professional manner.*
8. *Demonstrate effective work habits and effective communication skills with Sports Therapy staff, coaches, athletes/clients, and instructor.*
9. *Demonstrate 21st century leadership skills both in the classroom and practicum.*

