West Valley College
Date: 10-21-2019

ISLO

Creative Problem Solving
• Produce an original creative response that synthesizes research, planning, and practice.

Critical Thinking and Information Literacy
• Differentiate facts, influences, assumptions, and opinions to draw reasoned conclusions.

• Identify critical issues and apply investigative and analytical thinking to develop supporting arguments and a conclusion.

Effective Communication
• Articulate well-organized thoughts, ideas, and opinions in coherent form demonstrating oral proficiency.

• Articulate well-organized thoughts, ideas, and opinions in coherent form demonstrating standard written English or the target language.

Global Awareness and Diversity
• Explain how one or more of the following affects life experiences and social responsibilities: ability, race, ethnicity, class, gender, sexuality, and other markers of social identify.

• Explain the sensitivity and skills needed to live and work in diverse local and global communities.

Personal Responsibility
• Assess his or her knowledge, skills, and abilities to set achievable goals.

• Demonstrate dependability, reliability, and accountability.

• Manage personal health and/or well-being.

Quantitative and Qualitative Reasoning
• Collect, organize, analyze and process research data in a clear, synthesized format.

• Utilize quantitative and qualitative models to make predictions, draw conclusions, and make decisions that are logical and feasible.

Social Responsibility
• Apply ethical principles to personal , academic, professional and/or community issues.

• Demonstrate an awareness of civic, political, and/or social issues and explain the role of the individual in addressing these issues.

Technological Competency
• Identify, use or describe contemporary technologies specific to academic and/or workplace settings.

Default Department
Default Program

PSLO
No PSLOs

CSLO
No CSLOs

WVC Science & Math
WVC Astronomy

PSLO
No PSLOs

CSLO

ASTR002 - ASTRONOMY LABORATORY

ASTR005 - PLANETARIUM ASTRONOMY
• Identify how and which celestial object is used to measure the solar day, lunar month and tropical year.

ASTR010 - Solar System Astronomy
• The student will be able to determine the phase of the moon based on the temporal and spatial relationships between the Sun, Earth and Moon.

ASTR011 - Stellar Astronomy
• Explain the properties of a star based on a knowledge of its spectral characteristics.

ASTR014 - Life in the Universe
• The student will be able to explain the sources of energy utilized by life on planet Earth.

• Interpret and apply the

• Evaluate and demonstrate ability to make informed decisions pertaining to the environment.

• Apply proper use of laboratory equipment, techniques and/or technology commonly employed in the field of biology.

• Demonstrate critical thinking and/ or observational skills by applying knowledge of biological principles and concepts to a novel problem.

• Analyze and illustrate how evolution by natural selection can be seen at every level in the hierarchy of life.

• Demonstrate knowledge of the relationship between the structure of a biological component (such as an organism or ecological system) and its function.

• Demonstrate knowledge of how biological systems depend on obtaining, converting and releasing energy and matter.

CSLO

BIOL002 - Environmental Biology

• Analyze the evidence of global climate change.

• Analyze the effect of habitat destruction on global biodiversity.

• Analyze renewable and non-renewable energy sources.

BIOL002L - Environmental Biology Laboratory

• 1.   Explain how ecological variables that affect species survival are measured and analyzed.

• 2.   Analyze and interpret data from laboratory and field experiments.

• 3.   Provide overviews of issues affecting ocean sustainability.

• 4.   Explain and analyze the factors that contribute to carbon and ecological footprints of individuals and societies.

• 5.   Explain and analyze the relative contribution of different factors towards climate change, and explain the pros and cons of different approaches to slowing climate change.

BIOL010 - Introduction to Biology

• Evaluate decisions regarding health, wellness, biotechnology and environmental/ecological issues based on information learned in this course.

• Recognize how evolution accounts for the unity and diversity of life.

BIOL010L - Introduction to Biology Lab

• Design a lab experiment using the scientific method.

• Measure the effects of varying light levels on the rate of photosynthesis and account for these effects.

• Given observations in pseudocells under various osmotic pressures, predict how plant and animal cells will respond to these types of environmental changes.

BIOL011 - Human Biology

• Design an experiment using the scientific method.

• Demonstrate improved ability to make biologically informed decisions regarding health, wellness, and biotechnology issues based on information learned in this course.

BIOL012 - Introduction to Ecology and Wildlife

• Evaluate the role of keystone species within a community.

• Identify endemic and invasive species in and around campus

• Compare and contrast food webs in aquatic ecosystems with land-based ecosystems

BIOL013 - Natural History of California

• Evaluate and hypothesize on the abiotic conditions influencing community ecology.

• Identify dominant plant species in various California biotic communities.

BIOL014 - California Plants and Animals

BIOL041 - Principles of Animal Biology

• Explain how different animal taxa have solved the same physiological challenges in different ways in aquatic and terrestrial environments.

• Support an argument for common descent among animal phyla using evidence based on comparative zoology.

• Explain the process by which natural selection results in evolutionary change.

BIOL043 - Principles of Cell Biology

• List properties of viruses, prokaryotic and eukaryotic cells and, where appropriate their organelles. Describe how the structures and components of the mitochondria and chloroplasts support the endosymbiont theory.

• List the enzymes and cellular structures necessary to convert glucose and oxygen to carbon dioxide and water, identify the cellular locations of these enzymes, and calculate the effects on metabolism if any one step is poisoned or missing due to genetic mutation. Indicate the major points where metabolism is regulated to maintain energy homeostasis.

• List the enzymes and describe/diagram the processes and nucleotide sequences necessary to replicate DNA, make an RNA transcript from a gene, and synthesize a protein from an mRNA.

BIOL045 - Microbiology

WVC Chemistry

PSLO
No PSLOs

CSLO

CHEM001A - General Chemistry
• Complete basic gas law calculations and solve problems using fundamental gas law applications.

CHEM001B - General Chemistry
• Complete acid-base equilibria calculations and problems.

CHEM002 - Introductory Chemistry
• Demonstrate ability to complete basic gas law calculations and problems using fundamental gas law application.

CHEM012A - Organic Chemistry
• Apply basic nomenclature of poly-functional organic molecules to write a name from the structure and draw a structure from a name.

CIST004A1 - Computer Programming I (Java)
• Apply the techniques of structured (functional) decomposition to break a program into smaller pieces.

• Analyze and explain the behavior of simple programs involving the fundamental programming constructs using JAVA.

CIST004B - Computer Programming II (C++ Language)
• Design, implement, test and debug simple programs in an object- oriented programming language.

• Compare alternative implementations of Data Structures with respect to performance.

CIST004B1 - Computer Programming II (Java)
• Create a program which involves complex computation and operations using: I. JAVA fundamentals a Objects, Classes, Methods. b. Advanced Data Types. c. Unions d.Recursion e. Dynamic Allocation f.Bit manipulation. II. JAVA Foundation Framework. a. Numbers, Strings, Collections b. Files c.Memory Management.

CIST005A - Introduction to Python
• Design and implement basic Python programs using features like standard input/output, decision structures, repetition structures, functions, files, exceptions and recursion.

• Design and implement Python programs with built-in data structures like lists and tuples, strings, dictionaries and sets.

• Design and implement object-oriented Python programs using classes/objects, inheritance and polymorphism.

CIST005B - Advanced Python
• Use data structures to solve problems and use complexity analysis and big-O notation to evaluate the space/time tradeoff of different implementations of these collections.

CIST037 - C Programming
• Create a program which involves complex computation and operations using "c" language fundamentals: Advanced Data types, Unions, Recursion, Dynamic Allocation, Bit Manipulation and Documentation.

• Create, debug, test and run a program involving "C" fundamentals: numbers, strings, files and memory management.

CIST039 - Microcomputer Assembler Programming
• Create a program using computation and operations using the following Assembly programming fundamentals: bit manipulation, arrays, recursion, advanced data types, macros, and pseudo operations.

• Debug, test and run a program involving Assembly programming using numbers, strings and memory management.

CIST046A - Introduction to Linux
• Perform basic command-line utilities and maintain directory and file system, assigning permissions or access rights to specific users and groups of users.

• Perform secure remote connections with OpenSSH suite, compress and archive files/directories, and synchronize directories with rsync.

• Write and run simple shell scripts, chain Linux commands with pipelines, use regular expressions with Linux utilities.

CIST046B - Linux Shell Programming
• Use and evaluate vim, built-in commands and write shell scripts with variables, pipes, repetitions, and user-inputs.

• Use and evaluate regular expressions for pattern searching, sed for pattern searching/transformation and gawk for stream processing.

WVC Engineering

Engineering Technician with Water Emphasis, CERT
• Analyze unit operations of water disinfection and chemical treatment

Engineering, AS
• Identify and solve environmental problems.

• Apply diverse techniques, methods, and tools towards the solution of engineering problems

• Identify and apply ethical principles and standards.

• Apply the engineering process and design driven research.

• Apply fundamental science and engineering in an integrative fashion, to effectively work and solve problems at the interface of mathematics, science, engineering and technology.

• Conduct reliable independent work as well as teamwork experience.

• Demonstrate effective oral and written communication skills.

CSLO

ENGR003A - Basic Technical Drafting
• Using an engineering design process, and applying standard drawing conventions, generate 2D and 3D drawings using manual or computer-aided drafting methods to complete a plans and specifications sheet for an engineering project.

ENGR003B - Intermediate Technical Drafting
• Using an engineering design process, and applying standard drawing conventions, generate 3D drawings using manual or computer-aided drafting methods to complete a plans and specifications sheet for an engineering project.

ENGR003C - Advanced Technical Drafting
• Using an engineering design process, and applying standard drawing conventions, generate 2D and 3D drawings using manual or computer-aided drafting methods to complete a plans and specifications sheet for an engineering project.

ENGR004 - Introduction to Computer Aided Design
• Generate two and three dimensional drawings using AUTOCAD and demonstrate proficiency in a minimum of 15 2-D drawing tools in a final drawing.

ENGR005 - Advanced Computer-Aided Design
• Demonstrate proficiency in a minimum of 15 2-D drawing tools in a final drawing and generate three dimensional drawings using AUTOCAD.

ENGR010 - Introduction to Engineering
• Analyze and present data in solving engineering problems.

• Demonstrate teamwork skills required on an engineering design team.

• Prepare technical documents and deliver effective oral presentations.

ENGR020 - Engineering Graphics
• Using an engineering design process, and applying standard drawing conventions, generate 2D and 3D drawings using manual or computer-aided drafting methods to complete a plans and specifications sheet for an engineering project.

ENGR021 - Intro Computing for Scientists and Engineers
• Apply computer flow-logic and create programs to solve engineering problems.

ENGR025 - Introduction to Materials
• Evaluate the appropriateness of material(s) to meet engineering design criteria based on the materials' properties and performance.

ENGR060 - Programming and Problem-Solving in MATLAB
• Solve engineering problems via MATLAB using a symbolic language to deliver a correct solution.

ENGR098 - Introduction to Circuit Analysis
• Analyze the electrical behavior of DC and AC circuits including first and second order circuits using various circuit analysis techniques by calculating volts, ohms, and amps.

ENGR099 - Statics/Vector Mechanics
• Analyze methods to examine force systems acting on an engineering structure in static equilibrium.

• Analyze the internal distribution of bending and shear forces needed and select the proper size of the members of the structure.

• Evaluate the constraining reactions needed to maintain static equilibrium on two- and three-dimensional rigid bodies acted on by force systems.

ENGR166 - 166 Water Distribution II
• Explain metering methods of water flow and describe a system for calculating and recording volume.

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0 97.3munhods tobf 0 0 ize of the members of the structure.

• Apply observational skills and the scientific method to address problems in geology.

CSLO

GEOL001A - Physical Geology
• Identify and classify the common earth materials, such as most common minerals and rocks in the laboratory and in the field.

• Categorize the geologic column by organizing from oldest to youngest the geologic eons, eras, and epochs; and classify the major events of life history in geologic time.

• List and explain global and local geological processes such as earthquakes, volcanoes, landslides, and seismic sea waves.

GEOL001AH - Honors Physical Geology
• Identify and classify the common earth materials, such as most common minerals and rocks in the laboratory and in the field

• List and explain global and local geological processes such as earthquakes, volcanoes, landslides, and seismic sea waves

• Categorize the geologic column by organizing from oldest to youngest the geologic eons, eras, and epochs; and classify the major events of life history in geologic time.

GEOL001B - Historical Geology
• Analyze rock formations to create models of depositional environments, analyze rock formations to critique models of plate tectonic development, and evaluate the stratigraphic sequence of fossil groups based on principles of Darwinian evolution.

GEOL012 - Earth Science with Lab
• Explain the relationship between adiabatic cooling and heating of air as it rises and descends to explain the the latitude zones of tropics and deserts.Categorize and identify minerals based on luster, hardness, and cleavage.

GEOL015 - Geology of California
• Explain the basic principles of plate tectonics, geologic time, and sedimentary environments to interpret the geotectonic history of California through time.

GEOL020 - Field Geology
• Demonstrate competence mapping and interpreting rocks, rock structures, and geologic formations in the field using topographic base maps, aerial photos, geographic positioning systems, and pocket-transit compasses.

GEOL030 - Regional Geology Field Excursion
• Interpret geologic maps of the field excursion area.

• Identify the three fundamental rock groups based on texture and mineral composition.

WVC Mathematics

Mathematics, AS
• Apply appropriate technology including calculators and computers to the solution of mathematical problems.

• Adapt general mathematical techniques to course-specific problems.

• Solve problems using mathematical symbols, operations, and techniques appropriate to the course content and level of study.

• Demonstrate computational, estimation, and problem-solving skills.

• Construct mathematical models of physical problems, draw conclusions from these models, and communicate their conclusions.

• Formulate and test mathematical conjectures.

Mathematics, AS-T
• Solve problems using mathematical symbols, operations, and techniques appropriate to the course content and level of study.

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CSLO

MATH000D - Trigonometry
• Solve a trigonometric equation.

• Describe trigonometric and inverse trigonometric functions symbolically, graphically, and numerically.

MATH000G - Mathematics for the Liberal Arts Student
• Solve applied problems in finance, statistics, geometry, and probability.

• Demonstrate ability to use basic statistics to understand statistical problems, to validate conclusions and to develop meaningful predictions.

MATH001 - Pre-Calculus Algebra
• Evaluate a function, and determine the characteristics of a function, represented graphically, symbolically, or numerically.

• Form a mathematical model when given an application involving polynomial, rational, radical, exponential, or logarithmic functions.

MATH001C - Just-In-Time Support for Pre-Calculus Algebra
• Synthesize algebraic topics that leads to success in pre-calculus algebra.

MATH002 - Pre-Calculus Algebra and Trigonometry
• Evaluate a function, and determine the characteristics of a function, represented graphically, symbolically, or numerically, including determining the domain and range, the intervals on which the function is increasing or decreasing, where optimal values occur, and long-term behavior.

• Solve polynomial, rational, radical, exponential, logarithmic and trigonometric equations.

MATH003A - Calculus and Analytic Geometry
• Define, interpret, and evaluate the limit of a function.

• Define, evaluate, and solve application problems involving the derivative.

• Define and evaluate definite and indefinite integrals using the Fundamental Theorem of Calculus and/or properties of integrals.

MATH003B - Calculus and Analytical Geometry
• Apply the techniques of integration to solve problems involving integrals of algebraic and transcendental problems.

• Analyze convergence and divergence of sequences and series.

• Define, describe, and solve problems involving conic sections and the polar coordinate system.

MATH004A - Intermediate Calculus
• Find limits of, differentiate, and integrate vector-valued functions.

• Find limits of, differentiate, and integrate functions of several variables.

MATH004B - Differential Equations
• Recognize, classify, and solve a first-order differential equation.

• Generate an approximate solution (either using power series or numerical methods) to a differential equation.

• Analyze, model, solve, and
interpret an applied problem with a differential equation.

MATH004C - Linear Algebra
• Apply fundamental principles including the laws and theorems arising from the concepts of linear algebra covered in this course.

• Demonstrate knowledge of linear systems, matrices and vector spaces, including terminology and notation.

• Use the course material, along with technology, to solve applied problems.

MATH008 - Finite Mathematics
• Solve a linear programming problem using the simplex method.

• Use counting techniques to find the probability of an event in a real world situation.

MATH010 - Elementary Statistics
• Given visual displays of the distribution of several variables, compare and contrast the distributions, including discussions of center, spread, symmetry, skewness, and outliers.

• Given the description of a study in which an interval estimate or the result of a hypothesis test is provided, interpret the results of the interval estimate or hypothesis test.

MATH010C - Just-In-Time Support for Statistics
• Synthesize arithmetic, algebraic, and statistical topics that lead to success in elementary statistics.

MATH010H - Honors Elementary Statistics

- Given visual displays of the distribution of several variables, compare and contrast the distributions, including discussions of center, spread, symmetry, skewness, and outliers.

- Given the description of a study in which an interval estimate or the result of a hypothesis test is provided, interpret the results of the interval estimate or hypothesis test.

MATH012 - Applied Calculus
- Use the concepts of limits to compute a derivative and instantaneous rate of change.

- Use differentiation to solve application problems (like optimization).

MATH012C - Just-In-Time Support for Applied Calculus
- Synthesize algebraic topics that lead to success in Applied Calculus.

MATH014 - Math for Elementary School Teachers (number Systems)
- Identify patterns and relationships between operations involving whole numbers, integers, and rational numbers.

- Use different problem-solving strategies and approaches to solve a real-world application problem.

MATH019 - Discrete Mathematics
- Given a graph, find a Hamiltonian or Eulerian path and the chromatic number. Given two graphs, check to see if they are isomorphic.

- Determine if two logical expressions are equivalent by using truth tables or laws of logic.

MATH104 - Plane Geometry
- Identify a common geometric shape and find the perimeter, area, and volume of the shape.

- Use direct reasoning to formally prove that two triangles are similar or congruent.

- Use problem solving strategies to create and apply a geometric equation to a real-world problem.

MATH104R - Geometry Review for Trigonometry
- Identify a common geometric shape and find the perimeter, area, and volume of the shape.

- Use problem-solving strategies to create and apply a geometric equation to a real-world problem.

MATH105 - Pre-Statistics
- Analyze and interpret mathematical and physical meaning from tables, graphs, and algebraic functions.

- Create, analyze, and solve linear, exponential, and polynomial models describing real-life applications.

MATH106 - Intermediate Algebra
- Analyze, apply, and interpret quadratic and exponential functions.

- Describe and interpret relationships between quantities using graphs, tables, symbols, and words.

MATH106C - Just-in-Time Support for Intermediate Algebra
- Synthesize algebraic topics that leads to success in intermediate algebra.

MATH106P - Preparation for Intermediate Algebra
- Improve algebra skills by using an online learning system.

MATH106R - Intermediate Algebra - Review
- Analyze, apply, and interpret quadratic and exponential functions.

- Describe and interpret relationships between quantities using graphs, tables, symbols, and words.

MATH901 - Arithmetic Functions
- Perform the basic operations of addition, subtraction, multiplication, and division on whole numbers, fractions, and decimals.

- Solve application problems requiring the use of the basic operations of algebra.

MATH902P - Pre-Algebra
- Evaluate algebraic expressions involving order of operations, exponents, and grouping symbols.

- Translate phrases and sentences in English into algebraic expressions and equations.

- Solve linear equations in one variable.

MATH903 - Elementary Algebra

• Develop and apply linear functions that model real-world relationships.

• Justify, verify, and interpret solutions to symbolic and real world problems.

MATH903P - Preparation for Elementary Algebra
• Improve algebra and math study skills using an online learning system.

MATH903R - Elementary Algebra Review
• Develop and apply linear functions that model real-world relationships.

• Justify, verify, and interpret solutions to symbolic and real world problems.

MATHTMP1 - Transfer Math Preparation 1 - Preparation for Transfer Level
• Improve algebra and math study skills using an on-line learning system.

MATHTMP2 - Transfer Math Preparation 2 - Preparation for First Semester Calculus
• Improve pre-calculus algebra and trigonometry skills as well as math study skills using an
on-line learning system.

WVC Oceanography

• Estimate the solution to a problem, apply appopriate techniques to arrive at a solution, test the correctness of their solution, interpret their result and connect it to related areas of physics.

CSLO

PHYS001 - Introduction to Physics Problem Solving
• Apply core physical principles in conceptually describing the topics of mechanics.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate problem-solving techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

PHYS002A - General Physics- Mechanics
• Apply core physical principles in conceptually describing the topics of mechanics, fluid dynamics, thermodynamics and sound.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

• Set up an experiment, collect and analyze data, identify sources of error, and interpret results in relationship to physical concepts.

PHYS002B - General Physics - Electricity and Magnetism
• Apply core physical principles in conceptually describing the topics of electricity and magnetism, optics and modern physics.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

• Set up an experiment, collect and analyze data, identify sources of error, and interpret results in relationship to physical concepts.

PHYS004A - Engineering Physics-Mechanics
• Set up an experiment, collect and analyze data, identify sources of error, and interpret results in relationship to physical concepts.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

• Apply core physical principles in conceptually describing the topics of mechanics.

PHYS004B - Engineering Physics - Electricity and Magnetism
• Set up an experiment, collect and analyze data, identify sources of error, and interpret results in relationship to physical concepts.

• Apply core physical principles in conceptually describing the topics of electricity and magnetism.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

PHYS004C - Engineering Physics-Light, Heat and Waves
• Apply core physical principles in conceptually describing the topics of heat, light, waves and special relativity.

• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

• Set up an experiment, collect and analyze data, identify sources of error, and interpret results in relationship to physical concepts.

PHYS004D - Advanced Topics in Modern Physics
• Identify the essential aspects of a problem, formulate a problem-solving strategy, estimate the solution, apply appropriate techniques, test the correctness of the solution and interpret the results in relationship to physical concepts.

• Apply concepts from special relativity to analyze physical situations, including time dilation, length contraction, and the Lorentz transformation. Solve a variety of problems involving causality, relativistic momentum and energy, and cosmology.

• Apply basic concepts of quantum mechanics to analyze a variety of physical setups, including a particle in a box, simple atomic models, and nuclear decay.

• Apply core physical principles in conceptually describing the topics of modern physics.

PHYS010 - Conceptual Introduction to Physics
• Apply the concepts of Scientific Method, Newton's Laws of Motion, and Conservation of Energy.