CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

College Learning Outcomes Matrix: Rate each course from 1 to 5 with 5 being the most important.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Year of SLO Review	1. Written, Oral and Visual Communication	2. Scientific and Quantitative Reasoning	3. Critical Thinking/ Problem Solving	4. Information Literacy:	GE	Certificate
BIOL 110 Introduction to Biology	**11/12**	3	4	5	2	X	X
BIOL 110L Introduction to Biology Laboratory	**11/12**	4	5	5	1	X	X
BIOL 161 Field Botany		3	4	4	5		X
BIOL 162 General Ecology	**13/14**	3	3	5	2	X	X
BIOL 235 General Marine Biology	**13/14**	3	4	4	3	X	X
BIOL 237 Marine Ecology Field Studies	**13/14**	3	3	3	1		X
BIOL 244A Extended Field Studies		3	3	4	2		X
BIOL 244B Extended Field Studies		3	3	4	2		X
BIOL 245 Field Ecology of Marin (inactive)		2	3	3	1		X
BIOL 246 Field Ecology (inactive)		3	3	3	1		X
GEOG 112 Meteorology and Climatology		4	4	3	1		X
GEOL 120 Physical Geology		5	3	3	2		X
GEOL 120L Physical Geology Lab		4	5	3	3		X
GEOL 125 Field Geology I		3	5	5	2		X
GEOL 128 Geologic Studies of Pt. Reyes and the San Andreas Fault		3	5	5	3		X

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

College Learning Outcomes Matrix: Rate each course from 1 to 5 with 5 being the most important.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	**1. Written, Oral and Visual Communication**	**2. Scientific and Quantitative Reasoning**	**3. Critical Thinking/ Problem Solving**	**4. Information Literacy:**	**GE**	**Certificate**
BIOL 104 The Ecology of Infectious Diseases	4	3	3	3		E
BIOL 143 Stewardship of Marin Parks and Open Space	2	4	4	5		E
BIOL 164 Introduction to Mammalogy	2	4	3	1		E
BIOL 165 The World of Insects	3	3	3	5		E
BIOL 165L Introduction to Insect Biodiversity Laboratory	2	4	5	5		E
BIOL 167 Introduction to Herpetology	2	3	3	1		E
BIOL 169A Introduction to Ornithology A	2	4	3	1		E
BIOL 169B Introduction to Ornithology B	2	4	3	1		E
BIOL 170 Biology of Marine Animals (inactive)	2	3	3	1		E
BIOL 171 Biology of Marine Mammals	3	4	3	1		E

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

GENERAL EDUCATION SLOS
WHAT ASSIGNMENTS DO YOU GIVE IN THESE CLASSES THAT ASSESS THE FOLLOWING GE SLOS? What assessment tools do you use? Assess only SLOs that you rated 4 or 5.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	1. Written, Oral and Visual Communication	2. Scientific and Quantitative Reasoning	3. Critical Thinking/ Problem Solving	4. Information Literacy:
BIOL 110 Introduction to Biology	Essays, MC Test	Research paper/exam, Essays, MC Test	Research papers, MC Test Essays,	Essays, MC Test
BIOL 110L Introduction to Biology Laboratory	Essays, MC Test	Essays, MC Test	Essays, MC Test	Essays, MC Test
BIOL 161 Field Botany				
BIOL 162 General Ecology	Essays, MC Test	Essays, MC Test, Field research papers/oral written exam	Essays, MC Test, Field research papers/oral written exam	Essays, MC Test
BIOL 235 General Marine Biology				
BIOL 237 Marine Ecology Field Studies		Field research papers/oral written exam	Field research papers/oral written exam	
BIOL 244A Alaska Field Studies (Was BIOL 247A)		Essays, MC Test, Field research papers/oral written exam	Field Research papers	
BIOL 244B Yellowstone Field Studies (Was BIOL 247B)		Essays, MC Test, Field research papers/oral written exam	Field Research papers	
GEOG 112 Meteorology and Climatology	Local weather profile analysis Exam essays	Local weather profile analysis; Exam essays, calculations		
GEOL 120 Physical Geology	Exam essays			
GEOL 120L Physical Geology Lab	Exam essays; lab reports	Calculate fault offsets; CO2/temp		
GEOL 125 Field Geology I		Survey in field	Outcrop order	
GEOL 128 Geologic Studies of Pt. Reyes and the San Andreas Fault		Survey in field	Outcrop order	

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

GENERAL EDUCATION SLOS
WHAT ASSIGNMENTS DO YOU GIVE IN THESE CLASSES THAT ASSESS THE FOLLOWING GE SLOS? What assessment tools do you use? Assess only SLOs that you rated 4 or 5.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	1. Written, Oral and Visual Communication	2. Scientific and Quantitative Reasoning	3. Critical Thinking/ Problem Solving	4. Information Literacy:
BIOL 104 The Ecology of Infectious Diseases	Case study problem, Essay			
BIOL 143 Stewardship of Marin Parks and Open Space				
BIOL 164 Introduction to Mammalogy		Essays, MC Test, Field research papers/oral written exam		
BIOL 165 The World of Insects				
BIOL 165L Introduction to Insect Biodiversity Laboratory				
BIOL 167 Introduction to Herpetology		Essays, MC Test, Field research papers/oral written exam		
BIOL 169A Introduction to Ornithology A		Essays, MC Test, Field research papers/oral written exam		
BIOL 169B Introduction to Ornithology B		Essays, MC Test, Field research papers/oral written exam		
BIOL 170 Biology of Marine Animals (inactive)				
BIOL 171 Biology of Marine Mammals		Essays, MC Test, Field research		

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

REQUIREMENTS
BIOL 110 Introduction to Biology
BIOL 110L Introduction to Biology Lab
BIOL 161 Field Botany
BIOL 162 General Ecology
BIOL 235 General Marine Biology

BIOL 237 Marine Ecology Field Studies
Or
BIOL 247 Extended Field Studies

BIOL 245 Field Ecology of Marin
Or
BIOL 246 Field Ecology

GEOG 112 Meteorology and Climatology
GEOL 120 Physical Geology
GEOL 120L Physical Geology Lab

GEOL 125 Field Geology I
Or
GEOL 128 Geologic Studies of Marin County

In addition, complete six units from the following courses:

BIOL 104 Ecology of Infectious Diseases
BIOL/ENVS 143 Stewardship of Marin Parks and Open Space
BIOL 164 Introduction to Mammalogy
BIOL 165 The World of Insects
BIOL 165L Entomology Laboratory
BIOL 167 Introduction to Herpetology
BIOL 169A Introduction to Ornithology A
BIOL 169B Introduction to Ornithology B
BIOL 170 Biology of Marine Animals
BIOL 171 Biology of Marine Mammals

STUDENT LEARNING OUTCOMES

Students who have completed the requirements for this certificate will be able to:

1. Describe the major components of local ecosystems and explain their interrelationships.
2. Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well their origins and places in the local environment.
3. Predict likely changes to local communities and ecosystems under different conditions.

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

THESE CERTIFICATE OUTCOMES EQUAL WHICH COURSE OUTCOMES FOR THESE COURSES?

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Describe the major components of local ecosystems, and explain their interrelationships.	Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well as their origins and places in the local environment.	Predict likely changes to local communities and ecosystems under different conditions.
BIOL 110 Introduction to Biology	B5		C1, C2
BIOL 110L Introduction to Biology Laboratory	5		
BIOL 161 Field Botany	1, 2		6
BIOL 162 General Ecology	1, 2, 4		4
BIOL 235 General Marine Biology	1, 3		10
BIOL 237 Marine Ecology Field Studies	1, 9, 10, 11		1, 9, 10, 11
BIOL 244A Extended Field Studies	1, 7	2, 3, 4, 5, 6, 8	
BIOL 244B Extended Field Studies	1, 7	2, 3, 4, 5, 6, 8	
GEOG 112 Meteorology and Climatology	1, 3,	2	4, 5
GEOL 120 Physical Geology	1	1, 2	1, 3
GEOL 120L Physical Geology Lab	1	2, 3, 4, 6, 7, 9	
GEOL 125 Field Geology I	1	2	1, 2
GEOL 128 Geologic Studies of Pt. Reyes and the San Andreas Fault		1, 2, 3a-h	

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

THESE CERTIFICATE OUTCOMES EQUAL WHICH COURSE OUTCOMES FOR THESE COURSES?

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Describe the major components of local ecosystems, and explain their interrelationships.	Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well as their origins and places in the local environment.	Predict likely changes to local communities and ecosystems under different conditions
BIOL 104 The Ecology of Infectious Diseases	1	2, 3	4, 5
BIOL 143 Stewardship of Marin Parks and Open Space	3		1, 2, 3, 4, 7, 9
BIOL 164 Introduction to Mammalogy	3	1, 2, 4	3
BIOL 165 The World of Insects	3, 4, 5, 6, 7,	1, 2,	5
BIOL 165L Introduction to Insect Biodiversity Laboratory	7, 9	1, 2, 3, 4, 5, 6, 8	7, 9
BIOL 167 Introduction to Herpetology	4, 5, 6, 7, 8	1, 2, 4, 5	4, 5, 6, 7, 8
BIOL 169A Introduction to Ornithology A	2	1, 3	2
BIOL 169B Introduction to Ornithology B	2	1, 3	2
BIOL 171 Biology of Marine Mammals	2	1, 2, 3	2

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

IN WHICH COURSES ARE THESE CERTIFICATE SLOS ASSESSED? Use "I" for Intro, "P" for Practice and "M" for Mastery.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Describe the major components of local ecosystems, and explain their interrelationships.	Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well as their origins and places in the local environment.	Predict likely changes to local communities and ecosystems under different conditions.
BIOL 110 Introduction to Biology	I	I	I
BIOL 110L Introduction to Biology Laboratory	P	P	P
BIOL 161 Field Botany	I	I	I
BIOL 162 General Ecology	M	P	P
BIOL 235 General Marine Biology	M	P	P
BIOL 237 Marine Ecology Field Studies	M	P	P
BIOL 244A Field Ecology of Alaska (was 247A Extended Field Studies)	M	P	P
BIOL 244B Field Ecology of Yellowstone (was 247B Extended Field Studies)	M	P	P
GEOG 112 Meteorology and Climatology	I	P	I
GEOL 120 Physical Geology	I	P	I
GEOL 120L Physical Geology Lab	I	P	I
GEOL 125 Field Geology I	I	P	I
GEOL 128 Geologic Studies of Pt. Reyes and the San Andreas Fault	I	P	I

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

CERTIFICATE SLOS
WHAT ASSIGNMENTS DO YOU GIVE IN THESE CLASSES THAT ASSESS THE FOLLOWING CERTIFICATE SLOS?
What assessment tools do you use? Assess only SLOs that you rated 4 or 5.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Describe the major components of local ecosystems, and explain their interrelationships.	Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well as their origins and places in the local environment.	Predict likely changes to local communities and ecosystems under different conditions.
BIOL 110 Introduction to Biology	Food Web Activity	Food Web Activity	Food Web Activity
BIOL 110L Introduction to Biology Laboratory	Lab 2, Lab 4	Lab 4	Lab 2, Lab 3, Lab 4
BIOL 161 Field Botany			
BIOL 162 General Ecology	Describe a nutrient cycle	Describe how an ecosystem works	Assess change in a riparian ecosystem
BIOL 235 General Marine Biology			
BIOL 237 Marine Ecology Field Studies	Field research papers	Field research papers/	Field research papers
BIOL 244A Field Ecology of Alaska (BIOL 247A Extended Field Studies)	Essays, Field research papers	Essays, Field research papers	Essays, Field research papers
BIOL 244B Field Ecology of Yellowstone BIOL 247B Extended Field Studies	Essays, Field research papers	Essays, Field research papers	Essays, Field research papers

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

CERTIFICATE SLOS
WHAT ASSIGNMENTS DO YOU GIVE IN THESE CLASSES THAT ASSESS THE FOLLOWING CERTIFICATE SLOS?
What assessment tools do you use? Assess only SLOs that you rated 4 or 5.

CERTIFICATE of ACHIEVEMENT IN NATURAL HISTORY	Describe the major components of local ecosystems, and explain their interrelationships.	Use available resources and accepted procedures to identify species of living things, types of rocks and minerals and important meteorological phenomena, as well as their origins and places in the local environment.	Predict likely changes to local communities and ecosystems under different conditions.
GEOG 112 Meteorology and Climatology	Climate patterns activity; Essays, exam questions	Could observations; map reading; Essays, exam questions	Predict changes with climate change; Essays, exam questions
GEOL 120 Physical Geology	Serpentine soil activity; Essays, exam questions, presentations	Field ID of rocks; Essays, exam questions	Predict changes with climate change; Essays, exam questions
GEOL 120L Physical Geology Lab	Serpentine soil activity; Lab exercises, presentations	Field ID of rocks; Lab exercises, presentations	Predict changes with climate change; Lab exercises, presentations
GEOL 125 Field Geology I	Serpentine soil activity; Field exercises, presentations	Field ID of rocks; Field exercises, presentations	Predict changes with climate change; Field exercises, presentations
GEOL 128 Geologic Studies of Pt. Reyes and the San Andreas Fault	Serpentine soil activity; Field exercises, presentations	Field ID of rocks; Field exercises, presentations	Predict changes with climate change; Field exercises, presentations

BIOL_110	Introduction to Biology	Revise Course

Expected Outcomes for Student:

Upon completion of this course, students will be able to:

A. demonstrate general understanding of biology as a science by:

1. comparing and contrasting the subject matter of biology and other natural sciences with respect to scale and other unique properties
2. describing the important areas of biology and organizing them by scale or other characteristics
3. comparing and contrasting scientific methods and non-scientific methods of explaining phenomena and producing information
4. distinguishing science from pseudoscience and primary scientific information from secondary scientific information

B. use major principles, generalizations or theories of biology and related sciences to explain specific phenomena, including,

1. use of plate tectonic theory to explain current positions and characteristics of continents and ocean basins.
2. use of atomic theory to explain properties of different atoms and molecules, (especially biological macromolecules) and changes in chemical reactions.
3. use of cell theory and genetic theory to explain the continuity and change in cells and multicellular organisms, including inheritance of observable traits and interactions between genes and their environment.
4. use of principles of homeostasis and positive and negative feedback to explain changes in physiological status of organisms, including health and disease.
5. use of ecological theory to explain structure of communities and ecosystems and movement of energy and nutrients within the biosphere.
6. use of evolutionary theory to explain the Earth's biological diversity.

C. apply understanding of biology to suggest solutions to major problems of current human society, including

1. threats to environmental health, including massive species extinctions, disruption of community relationships and altered ecosystem function.
2. threats to human health, including starvation, disease and lowered quality of life.

BIOL_110L	Introduction to Biology Laboratory	Revise Course

Expected Outcomes for Student:

Upon completion of this course, students will be able to:
1. Carry out observations, construct hypotheses, perform experiments and interpret them in the context of important biological theories.
2. Use correctly the international system (SI or metric system) of measurement.
3. Select correct kind of microscope for viewing small specimens, prepare specimens for viewing and bring them into good focus with optimum illumination.
4. Use Bunsen burners, glassware and other laboratory equipment safely and effectively.
5. Use ecological measuring equipment safely and effectively in the field.
6. Carry out random sampling procedures of large populations.
7. Produce simple, well-labeled lined drawings.
8. Make simple mathematical summaries of data.
9. Draw and interpret simple graphs and construct and interpret data tables.
10. Produce coherent written records of laboratory and field work.
11. Work effectively in small groups.

BIOL_161	Field Botany	Revise Course

Expected Outcomes for Student:

By the end of the semester, students should be able to:
1. Explain the principal ecological factors most likely to be responsible for producing the groupings of plants encountered at most places in the county.
2. Recognize the major ecological communities of Marin by their dominant plant species and discuss important ecological process for each community.
3. Identify basic concepts of plant anatomy and evolution necessary to use the keys in the most-recently published local flora to identify selected species of plants and place them correctly in the larger system of botanical classification.
4. Recognize the approximately thirty plant families that include the vast majority of common plants likely to be encountered in the county.
5. Demonstrate proper use of basic field and laboratory equipment needed for plant identification, including preparation of botanical specimens for later study in laboratory and herbarium.
6. Discuss predictions for the future of the Marin flora, including likely changes to populations of rare and endangered species as well as to populations of weeds introduced by humans.

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

BIOL_162	General Ecology	Revise Course
Expected Outcomes for Student:		
1. describe how the study of environmental sciences can provide students insight into the dynamic mechanisms that shape the ecology of local biotic communities 2. describe how the study of environmental sciences can provide students insight into the dynamic mechanisms that shape the ecology of the planet. 3. Identify the natural history of key organisms of local biotic communities. 4. discuss the interrelationships of all levels of ecological study.		

BIOL_235	General Marine Biology	Revise Course
Expected Outcomes for Student:		
Upon completion of this course, students will be able to demonstrate that they: 1) analyze, compare, contrast and distinguish various survival strategies of the most common species of marine invertebrate and vertebrates living in the rocky, sand flat, and mud flat intertidal regions of Central California 2) inventory the diversity of marine taxa and differentiate the fundamental oceanagraphic processes of which these species must endure to survive 3)discuss concepts and debate in marine biology along with the differences and similarities in terrestrial and other life systems 4) relate to the scientific method and research techniques to understand marine ecosystems 5) examine a fish or shark and inspect anatomical functional morphology 6) appraise and differentiate local holoplankton as well as meroplankton using a microscope 7) interpret, recognize and discuss the foundation knowledge and skills to commence to upper division studies in marine sciences 8) demonstrate they are safe while conducting marine-related field work or teaching in a variety of marine habitats. 9) explain the extent of and how human actions are interfering with the functioning of and contributing to the collapse of marine ecosystems.		

BIOL_237	Marine Ecology Field Studies	Revise Course

Expected Outcomes for Student:

1. Explain how plants and animals inhabiting marine communities have evolved with and adjusted to the physical factors (including spacial and temporal variables associated with rocky intertidal, mud and sandflats, estuaries and redwood forests) of these communities.
2. Describe the Zonation and phylogeny of marine invertebrates common to these intertidal and forest systems.
3. List the life histories and ecology of marine Algae.
4. Demonstrate how to preserve marine algae for a herbarium collection.
5. Explain the latest findings in Marine microbe ecology.
6. Identify marine and coastal forest birds.
7. Identify common marine and coastal forest mammals of the Pacific Northwest Region.
8. Explain and understand the diving physiology of marine mammals.
9. Describe how wave dynamics and long-shore drift shape the geomorphology of sandy beaches.
10. Explain Coastal forest ecology and succession.
11. Explain and understand how logging practices have destroyed the Pacific Northwest forests.
12. Describe the biology of owls of the Pacific Northwest forests and identify the most common species of owl by call.

BIOL_244A	Alaska Field Studies	New Course

Expected Outcomes for Student:

Upon completion of Biol 244A, students will be able to:
1. Judge, appraise, evaluate and debate the evidence for Global Climate Disruption
2. Categorize trees, arctic flowers and birds of Alaska
3. Demonstrate and apply the use of a dichotomous key
4. Explain and describe the common mammal tracks of Alaska
5. Name, recall and relate to all of the mammals common to Alaska
6. Name, recall and relate to all of the birds common to Alaska
7 Discuss how mammals, trees, perennials, and birds are adapted to extremely cold conditions
8. Distinguish and differentiate all marine mammals common to coastal Alaska including pinnipeds, cetaceans and sea otters

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

BIOL_244B	Greater Yellowstone Ecosystem Field Studies	New Course
Expected Outcomes for Student:		
Upon completion of Biol 244B, students will be able to: 1. Judge, appraise, evaluate and debate the evidence for the need for Bison and wolf restoration in the Greater Yellowstone Ecosystem 2. Categorize trees, flowers and birds of the Greater Yellowstone Ecosystem 3. Demonstrate and apply the use of a dichotomous key 4. Explain and describe the common mammal tracks of Yellowstone 5. Name, recall and relate to all of the mammals common to Yellowstone 6. Name, recall and relate to all of the birds common to Yellowstone 7 Discuss how mammals, trees, perennials, and birds are adapted to cold winter conditions 8. Distinguish and differentiate the various microbial thermophilic communities common to the hydrothermal structure of Yellowstone.		

GEOG_112	Meteorology and Climatology	Revise Course
Expected Outcomes for Student:		
1. Explain how energy is transferred throughout the Earth system. 2. Identify forcing mechanisms for upward vertical motions and explain how they can lead to cloud and precipitation formation. 3. Apply basic knowledge of atmospheric processes to dissect and explain weather phenomenon or climate systems. 4. Use the scientific method to assess atmospheric processes. 5. Analyze and interpret data presented in graphs, weather maps, and statistical analysis.		

GEOL_120	Physical Geology	Revise Course
Expected Outcomes for Student:		
1. define endogenic and exogenic forces and processes that drive and resist the forces of change to the quasi equilibrium conditions of our Earth's lithospheric regime 2. recognize basic mineral and rock types, geologic structures. 3. recognize problematic concerns of our ever-shrinking natural resources 4. explain the significance of geologic time.		

GEOL_120L	Physical Geology Laboratory	Revise Course

Expected Outcomes for Student:

At the conclusion of this course, the student should be able to:

1. Describe and discuss the principles of physical geology
2. Identify rock and mineral specimens common to earth
3. Describe and discuss the geology and fossils of each geologic period, and
4. Identify fossils representative of each geologic period.
5. Reconnoiter the earth with high precision using a topographic map, compass and protractor
6. Calculate stream discharge, read a flood frequency and hydrography and predict flood events based on the data provided
7. Make structural cross-sections from geologic maps and develop the geologic history of the area based on that cross-section
8. Demonstrate the ability to use a microscope
9. Exhibit the ability to record field observations of exposed rock.
10. Using a brunton compass, obtain the attitude of bedding plains, joints, and faults in the field
11. Identify the common forms of faults and folds expressed in exposed rock

GEOL_125	Field Geology I	Revise Course

Expected Outcomes for Student:

1. Evaluate a field site in regards to its rocks and prominent geologic structures
2. Assemble knowledge about Marin County through combining information from seminal peer-reviewed papers and first-hand field experience
3. Assess questions about Marin County hazards, such as susceptibility to landslides and liquefaction
4. Revise poorly-mapped areas with more detailed field observations, such as inclusion of previously-unmapped faults and rock outcropping

GEOL_128	Geographical Studies of Pt. Reyes and the San Andreas Fault	Revise Course

Expected Outcomes for Student:

-Identify, classify, and describe minerals and rocks observed in the field
-Identify, classify and describe geologic structures observed
-Synthesize geologic concepts with field observations including
-recognition of the geological processes that produced and continue to produce the peninsula, association of the basic geological principles that allow an ordering of the geological history of the peninsula, and construction of a generalized geological stratigraphic column for the peninsula
-Hypothesize interpretations of various features and rock outcrops based on the application of basic geologic concepts
-Utilize topographic, geologic maps and geologic cross sections to formulate interpretations based on spatial and stratigraphic positions of features and rocks
-Recognize and evaluate geological hazards in the Pt. Reyes area
-Recognize the geomorphic processes responsible for various features in the Pt. Reyes area, including
-waves, tides, streams, and estuarine processes acting in and around the Pt. Reyes area
-Recognize the characteristic features created by the San Andreas Fault
-Understand the role that the San Andreas Fault has played and continues to play in the development of the peninsula
-Relate plate tectonic processes as they relate to the San Andreas Fault and features exposed on the Pt. Reyes peninsula

BIOL_104	THE ECOLOGY OF INFECTIOUS DISEASE	Revise Course
Expected Outcomes for Student:		
1. Describe the natural history of infectious disease and its significance. 2. Explain the biology of disease producing microorganisms and how it affects the location, spread, and control of particular infectious diseases. 3. Compare the relationship between microorganisms, vectors and hosts. 4. Define the basic tenets of geographic medicine including climactic, biological and sociological factors. 5. Explain the role that human activity has played and continues to play in the occurrence of epidemics.		

BIOL_143	Stewardship of Marin Parks and Open Space	Revise Course
Expected Outcomes for Student:		
1. Describe major concepts and beliefs underlying the designation of parklands as different from other lands used by our modern civilization. 2. Outline the major events that led to our parklands being set aside for the special uses they serve today. 3. Describe the major processes of natural change that influence any piece of parkland and require attention from park visitors and park managers. 4. Describe the human activities that take place on parklands and how they relate to the modern concept of stewardship. 5. Name and describe both sides of some of the principal conflicts over approaches to managing parklands that have made headlines in Marin and around the world. 6. Explain the principal challenges and methods of management on the ground, as seen in the plans and activities articulated by the major agencies and individuals managing parkland in Marin. 7. Offer some suggestions of what should be done in a specific parkland and make a few predictions of what will likely happen to it in the future if these suggestions are followed and/or not followed. 8. Describe the general nature of park and open space management jobs and decide whether they represent a possible career option. 9. Use insights and experience gained from studying the process of solving local environmental problems in meeting environmental challenges of the future.		

BIOL_164	Introduction to Mammalogy	Revise Course

Expected Outcomes for Student:

1. Identify skulls of most local species of mammals to genus level.
2. Identify tracks and sign, including scat of all local carnivore species to genus level and most other mammals to family level.
3. Demonstrae their knowledge of the natural history, ecology and behavior of all most North American families of mammals including all orders mentioned in lectures.
4. Demonstrate the process of studying mammals effectively in the field and laboratory.

BIOL_165	The World of Insects	Revise Course

Expected Outcomes for Student:

Upon completion of this course, students will be able to:

1. Describe how insects are different in structure and function from other groups of living things.
2. List the major groups (orders) of insects
3. Understand the major events in the evolutionary history of insects
4. Describe the major habitats in which insects are found and some of the insects adaptations to each one
5. Describe the major ecological niches that insects occupy and some of the insects adaptations to each one
6. Understand the major impacts insects have had on humans and human civilizations.
7. Understand the major impact humans have had on insects and through them, on the rest of the biosphere
8. Appreciate the importance of insects in the modern world.

BIOL_165L	Introduction to Insect Biodiversity Laboratory	New Course

Expected Outcomes for Student:

Upon completion of this course, students will be able to:
1. Identify major structures of insect internal external and internal anatomy, when necessary with aid of hand lens or with stereoscopic or compoun microscope.
2. Identify unique anatomical structures of different insect orders, when necessary with aid of hand lens or with stereoscopic or compound microscope.
3. Identify on sight major orders and families of insects, when necessary with aid of hand lens or with stereoscopic or compound microscope.
4. Use dichotomous keys to identify insects to family level, when necessary with aid of hand lens or with stereoscopic or compound microscope.
5. Use print and electronic media to access information about individual insect species.
6. Locate and collect insects in major field habitats, using appropriate field equipment.
7. Describe major ecological niches of selected important families and genera.
8. Prepare wet, dry and microscopic specimens of insects for further study, using appropriate laboratory equipment.
9. Describe how modern insect faunas are the result of present and past evolutionary and ecological factors.

BIOL_167	Introduction to Herpetology	Revise Course

Expected Outcomes for Student:

Upon completion of this course students will be able to:
~identify most local species of amphibians and reptiles to genus level.
~demonstrate their knowledge of the natural history, ecology and behavior of all local species and most North American families of amphibians and reptiles including some common families worldwide.
~capture and study amphibians and reptiles effectively in the field and laboratory
~conduct a population ecology study on most any species of Western North American lizard.
~demonstrate care of most amphibians and reptiles in a vivarium.

CERTIFICATE OF ACHIEVEMENT IN NATURAL HISTORY

BIOL_169A	Introduction to Ornithology A	Revise Course
Expected Outcomes for Student:		
Upon completion of this course, students will be able to: 1. Understand how bird form, function, anatomy, physiology, flight mechanics and migration enable birds to have become adapted to a wide variety of habitats. 2. Understand how birds are integral to the sustainable functioning of ecosystems. 3. Identify California birds as well as be able to efficiently use equipment associated with the study of birds in the field, including binoculars, spotting scopes, mist nets and recorders.		

BIOL_169B	Introduction to Ornithology B	New Course
Expected Outcomes for Student:		
Upon completion of this course, students will be able to: 1. Understand the principles of ornithology and how bird behavior, vocal behavior, bird reproductive biology, and avian ecology enable birds to have become adapted to a wide variety of habitats. 2. Identify birds in the field and understand their behavior as well as complete a scientific study of involving nesting, courting, feeding, and migrating behavior. 3. Efficiently use equipment associated with the study of birds in the field, including binoculars, spotting scopes, mist nets and recorders.		

BIOL_171	Biology of Marine Mammals	Revise Course
Expected Outcomes for Student:		
1) analyze, compare, contrast and distinguish various survival strategies of the most common Pinnipeds and Cetaceans living within the waters of the Central California coast, Arctic and Antarctic. 2) investigate the diversity of local taxa and differentiate the fundamental abiotic and biotic variables of which these species must endure to survive. 3) evaluate concepts and debate in local natural history along with the differences and similarities in terrestrial life systems.		