Environmental Education Emphasis (within ESTP Major)

The mission of the environmental education emphasis is to enable students to understand and describe complex environmental concepts for the purpose of bridging the gap between scientific and nonscientific communities. Students in this emphasis will understand the methods of inquiry scientists use to analyze environmental problems and understand other ways of analyzing environmental problems that complement the scientific approach. In addition, they will be experienced working in diverse, multicultural communities. This emphasis differs from many environmental education programs by requiring students to become technologically competent in one of the following areas: multimedia, mass communication outreach or GIS/GPS/RS.

Course	Course Title	Prerequisites
MLO #1: QUANTITATIVE FOUNDATIONS: Students must be able to apply the fundamental mathematical and statistical constructs used to communicate quantitative information within the context of Environmental Science, Technology & Policy.		
Each of the following courses:		
MATH 150	Calculus I	MATH 130
STAT 100 OR 250	Intro to Statistics *OR* Applied Statistics for Scientists	For STAT100: MATH 99 OR ELMT SCORE 50 For STAT 250: MATH150; recommend 151
MLO #2: EARTH SYSTEMS SCIENCE & POLICY FOUNDATIONS: Students must be able to apply basic scientific principles and methods to the study of a) major physical and life science components of the earth system, including the atmosphere, biosphere, geosphere, and hydrosphere, as well as the chemical and physical processes underlying these components and b) human components of the earth system including the social, economic, and political structures that shape our interactions with our environment.		
Each of the following courses:		
CHEM 110/L	Chemistry I	CHEM109, MATH130 (Concurrent is ok)
CHEM 111/L	Chemistry II	CHEM110, CHEM110L, MATH130
BIO 240/L	Biology I: Ecology, Evolution & Biodiversity	CHEM 110
ENVS 271	The Oceans	MATH 98 or ELMT Score 46
ENVS 272	The Atmosphere	MATH 98 or ELMT Score 46
ENVS 283	Politics & the Environment	Eng Com A ULR
ENVS 284	Environmental Economics & Management	MATH 150
GEOL 260/L	Geology / Hydrology	CHEM 110 & MATH 130
PHYS 150/L *OR* PHYS 220/L	Physics for Biologists (PHYS150/L) *OR* Physics I (PHYS220/L)	MATH 130 & (CHEM109 or CHEM110) *OR* (CHEM110, MATH150)
And one of the following courses:		
BIO 204	Introduction to Life Sciences	MATH99 or ELMT Score 50 or higher. Exclude 1st time Freshmen
BIO 241/L	Biology II: Cellular and Molecular Biology	CHEM 111/L & MATH 130
MLO #3: NATURAL SCIENCE COMPETENCY Students must be able to understand, use, and accurately communicate advanced scientific concepts.		
One of the following:		
BIO 340/L	Ecology	BIO 240 & MATH 150 (MATH 151 recommended)
BIO 342/L	California Ecosystems	BIO 240 & GEOL260
BIO 345/L	Marine Biology	BIO240 & CHEM111 & CST101
GEOL 360/L	Geomorphic Systems	GEOL 260
MLO #4: POLICY COMPETENCY: Students must understand and accurately communicate state, federal, and local political structures and processes and their relationships, as well as landmark environmental laws and regulations.		
One of the following courses:		
ENVS 384S	Environmental Justice & Environmental Policy Service Learning	Eng Com A; instructor consent
ENVS 386	Science, the Environment, and the Political Process	Eng Com A & Eng Com B & ENVS283
ENVS 387	Water Resources Assessment, Law and Policy	GEOL260 & Eng Com A
SBS 385	CA/Gov/Politic/Environ/History	none

MLO #5: DATA ACQUISITION, ANALYSIS, AND DISPLAY: Demonstrate proficiency with current technologies for acquiring, analyzing, and displaying data relevant to a real-world problem.			
Choose one of the following focus areas:			
Multimedia:	CST201/L	Media Tools	CST101
Mass Communication Outreach:	TAT337/L	Production Foundations	
GIS/GPS/RS:	ENVS332/L	Intro to GIS and GPS	(CST101 or ENVS300L) & (STAT100 or STAT250)

MLO #6 SYSTEMS APPROACH TO ENVIRONMENTAL DECISION MAKING: Students must be able to demonstrate skill in the application of general systems theory, system modeling, stakeholder analysis, cost/benefit analysis or other interdisciplinary analysis tools to evaluate the equitability and the effectiveness of alternative environmental decisions, policies, or actions.

One of the following courses. Courses may not be double counted for two different MLOs.

ENVS 301	Ecosystems Services: Scientific and Economic Analyses	(ENVS 283 OR ENVS 284), MATH 150, BIO 240
ENVS 303/L	California Transect Orientation	BIO 240, ENVS 283, ENVS 284, GEOL 260, & instructor consent
ENVS 309	Science & Policy of Global Change	(BIO 240 OR GEOL 260) & (ENVS 280) OR (ENVS 283 & ENVS 284)
ENVS440	Environmental Modeling	MATH151 & (BIO340 or GEOL360)
ENVS470	Marine Conservation Biology	BIO340 & BIO345 & BIO300

MLO #7: AREA OF CONCENTRATION: Students must be able to apply advanced knowledge and skills in technology, teaching, and natural history. *Important: All students should meet with their upper-division advisor to select a sequence of courses appropriate to their career goals.*

Group I. Technology Skills. Choose an advanced course from the focus chosen in MLO #5:

Multimedia:	CST 251/L	Basic Web Design	CST 101
	CST 328	Digital Art and Design	CST 201 or instructor consent
Mass Communication Outreach:	TAT 339/L	Advanced Video Production	TAT237 or TAT 337
	TAT 361	Introduction to Non-Linear Editing	None
GIS/GPS/RS:	ENVS 436/L	Remote Sensing and Image Processing	ENVS 332/L

Group II. Teaching Experience One Service Learning course with a Teaching Focus:

ENVS 349S	Natural History Interpretation	(BIO 204 OR BIO 240) & (CST 101 OR ENVS 300L)
ENVS 369S	Community-Based Watershed Restoration Service Learning	Science Content OR Science Methods ULR

Group III. One Natural History course not taken for MLO #3:

BIO 342/L	California Ecosystems	BIO 240 & GEOL260
BIO 345/L	Marine Biology	BIO 240 & CHEM 111 & CST101
BIO 347	Working with Marine Mammals	BIO204 or BIO240
BIO360/L	Vertebrate Natural History	BIO240/L
	Other Natural History course approved by your advisor	

MLO #8: SCIENTIFIC INQUIRY: Students must use the scientific method to design, conduct, and interpret natural science and/or social science investigations, and understand the ethical norms that guide scientific practice.

Complete one of the following:

ENVS 350/L	Quantitative Field Methods	BIO 240 & STAT 250
ENVS 355/L	Environmental Monitoring	(STAT 100 or STAT200 or STAT 250) & (CHEM 111 OR GEOL 260)
SBS 362/L	Research Methods for SBS: Qual Emph	None
SBS 366/L	Research Methods for SBS: Quant Emph	STAT100

MLO #9: EFFECTIVE COMMUNICATION: Students must present clearly (in both written and oral formats) analyses of complex Environmental Science, Technology & Policy issues.

ENVS 300	Reading, Writing, and Critical Thinking in ESTP	(Eng Com A & Eng Com B & BIO 240) & (ESSP 280 OR ENVS 283 OR Dem Part ULR)
ENVS400	Capstone I Seminar	ESSP300 or ENVS300
ENVS402 or ENVS403	Capstone II Seminar	ENVS402: (ENVS400 & ENVS495 w/ grade of A- or above) ENVS403: ENVS400

MLO #10: SERVICE LEARNING: Students must demonstrate the ability to combine disciplinary knowledge and community experiences to share the relevance and importance of science with culturally, linguistically, technologically, and economically diverse populations in the context of issues of social responsibility, justice, diversity, and compassion.

One of the following in addition to courses used to fulfill MLOs #7 and #8. May be double counted in other MLOs.

ENVS 349S	Natural History Interpretation	(BIO 204 OR BIO 240) & (CST 101 OR ENVS 300L)
ENVS 369S	Community-Based Watershed Restoration Service Learning	Science Content OR Science Methods ULR
ENVS 384S	Environmental Justice & Environmental Policy Service Learning	ENG COM A, instructor consent
MATH361S	Mathematics Tutors	MATH130 and SL200
SL394S	Service & Social Justice SL	None