

PROPOSAL TITLE A textbook in Ethnobotany: A scientific approach to understanding traditional relationships of people and plants

ABSTRACT:

Once you have finished answering the questions within the following application, please provide an abstract below summarizing the description of your sabbatical leave proposal in a paragraph of between 100-150 words. This abstract will become part of the Board Docket. Please include the following information as part of the abstract:

- **Need for the Professional Growth** - describe the purpose of the sabbatical leave.
- **Sabbatical Leave Activities** - describe what you plan to do.
- **Anticipated Outcomes** - describe the primary outcome; instructor and classroom teaching outcomes; professional/faculty relationship outcome; student outcomes.
- **Means of Measurement** - describe what evidence you will submit to demonstrate achievement of your outcomes.
- **Expected benefit to the students, department, college, district, and/or community**

My proposed sabbatical activity will allow me to maintain a currency in the field of plant biology and deepen my knowledge in Kumeyaay plant taxonomy and uses of Southern California native flora. I plan on writing a textbook to support the new associate degree in Kumeyaay Studies for the course Bio 134: Ethnobotany. A textbook will be self-published and available to students at a low cost on a site such as kindle direct publishing from amazon. This will provide a reasonably priced biology textbook to increase student access and completion of a science GE transferrable course. This will strengthen the rigor of the program and increase successful completion of coursework. This sabbatical project aligns with the college's goal to increase student enrollment and retention of underserved communities and will serve to foster the relationship between Cuyamaca College and the Sycuan Band of the Kumeyaay Nation. It will contribute to the field of ethnobotany by examining the intricate relationship the local indigenous peoples have developed with the natural world.

PROPOSAL:

As you prepare this proposal, it is also strongly recommended that you consult with the Department Chair/Coordinator and Dean prior to submittal to address any issues or to provide additional information or clarification regarding the proposal.

Please answer each question carefully and completely (do not say "please see above") in order to provide the Sabbatical Leave Committee with as much information as possible for their review and scoring. Provide background information and/or references to supporting documentation where appropriate.

Need for Sabbatical

1. How does your proposed activity meet the need for professional and personal growth?

Plant taxonomy is a rapidly changing discipline. As new data becomes available to deduce evolutionary relationships, scientific names and phylogenetic classifications are modified. My proposed sabbatical activity will allow me to maintain a currency in my field and share my most up to date findings with my students. As a plant biologist, collecting and classifying native flora is an important skill. This project will also allow me to sharpen my identification skills and refresh my passion for this field.

Recently, I have been teaching in an emergent field in science, Ethnobotany. It is the scientific study of the relationships that exist between peoples and plants from the perspective of their traditional medicinal, cultural and utilitarian uses. This project will allow me to broaden and deepen my understanding of the subject as I link the native flora with the indigenous knowledge about the plant. I will obtain a better understanding of the plant anatomy and how this is related to the utilization of the plant by indigenous people.

2. How does your proposed activity benefit (please address at least three of the following):
a. the students?

In Bio 134: Ethnobotany, the lack of an appropriate textbook will hinder students' ability to learn the material effectively. The scope of this course requires that students utilize the tools of scientific inquiry to study the plants and their utilization by the Kumeyaay. It is very difficult to study and learn to identify plant species and understand their uses without a textbook covering this material. The ethnobotany textbook will provide students with the botanical background necessary to scientifically classify native plants, identify their anatomical structures and phytochemical composition.

The Kumeyaay have an oral tradition. Their libraries are in the minds of their elders. This is not readily accessible to students. This is the only college course that covers specifically how the Kumeyaay utilize native flora. As such, there is currently not a resource available to inspire and engage students, which is greatly needed to increase student learning and success.

This sabbatical activity will take the knowledge that I have learned in teaching with indigenous elders in the past, allow me to research and gather more information, and make it available for students to easily access.

Providing a reasonably priced science textbook will increase student access and completion of science GE. Typically, science textbooks are incredibly expensive. In order to retain low-income students in the course, an affordable textbook is a necessity. As this course will transfer as science GE in biology, it provides an alternative to general biology (Bio 130) for students. This will help alleviate the impacted enrollment for Bio 130; freeing up needed spots for our Allied Health students.

This sabbatical project also supports the newly formed student organization, Native American Student Alliance, which promotes the advancement and education of their highly underrepresented student group.

b. the institution?

As an institution that sits on Kumeyaay land and whose name is Kumeyaay in origin, it is fitting that Cuyamaca College has a commitment to supporting educational opportunities for underrepresented student groups, such as Native Americans. This sabbatical project aligns with the college's goal to increase student enrollment and retention of underserved communities by developing course materials to support the new associate degree in Kumeyaay Studies. This project also shows a commitment to the success of this new program to our indigenous neighbors at Sycuan Indian Reservation.

The fifth chapter of the textbook, "Important medicinal plant families and species" will also support the college's goal of sustainability. This chapter will provide a detailed analysis of the flora of the Cuyamaca College Nature Preserve and will be used as a reference for the biology department to classify and identify native and non-native species within the preserve. This can aid in invasive species removal and native habitat protection within the college's 53-acre nature preserve. This is in alignment with the college's value on environmental stewardship and sustainability.

This project is not just about a textbook, it is about a vision. This vision is preserving knowledge from an ancient people, the Kumeyaay, which lived sustainably off of this land for thousands of years. This ability to live off of the land without exploiting that land was due to the relationship the Kumeyaay developed with the native flora. This type of relationship, where one gives as they receive, is an important virtue to develop in our students at Cuyamaca. This project is a part of this vision.

This project also supports the college in fulfilling its mission to increase student access, learning and success.

c. the community?

This project will provide educational materials about the natural environment and promote awareness of different cultures. It will also provide a resource of information to a highly underrepresented community in higher education. As the text will include the ethnobotanical information and Kumeyaay plant taxonomy, it will also assist in the preservation of an endangered language and can be further utilized by the Kumeyaay language classes. Preserving language through ethnobotanical knowledge has the potential to bring people from the Kumeyaay community to campus that normally would never leave the reservation. This can be a source of educational outreach to a highly underserved population.

Providing this educational resource will also help continue the development of Cuyamaca College's partnership with the Sycuan Band of the Kumeyaay Nation and the Kumeyaay Community College. This is in support of the college's mission to focus on community development and the value of maintaining strong relations within the community.

d. the discipline/contribution to scholarship

This textbook will contribute to the field of ethnobotany by examining the intricate relationship the local indigenous peoples have developed with the natural world. The Kumeyaay/Diegueno people, who are the original people living on the land of Cuyamaca College, have a deep understanding of their natural environment. This knowledge is embedded in the taxonomies and oral traditions of the people. This knowledge is lost as elders in the community pass on.

Researching and documenting this ancient knowledge, through the lens of scientific inquiry, will preserve and sustain this information in a manner that can be passed on for generations.

3. Describe the relevancy of your activity to your current/new assignment and the improvement of student learning.

Cuyamaca College is currently finalizing an associate degree in Kumeyaay Studies. This sabbatical activity is needed to provide students with accessible educational materials to strengthen the rigor of the program and increase the successful completion of coursework leading to completion of the degree. Cuyamaca College is truly at the forefront in this field by offering this degree; however, new educational materials are necessary to develop an effective transferrable program.

Description of Overall Activity

4. Please provide a brief description and purpose of the proposed sabbatical leave activity.

The purpose of this sabbatical project is to develop an Ethnobotany textbook to support the modified curriculum for Bio 134: Ethnobotany. New curriculum has been written for the course to transfer as a science GE course, and currently, there is not a text available that covers the breadth of this course. This textbook will utilize the principles of scientific inquiry and modern plant biology to classify native plants, identify their anatomical structures and phytochemical composition. This information will be related to how plants were woven into the culture of indigenous populations and how plants were used to sustain, heal and protect their people. Ethnobotanical knowledge from the Kumeyaay/Diegueno people of southern California will be the focus.

Native flora of Southern California will be collected and documented using microscopy. These images will be utilized as figures in the textbook providing detailed imagery to promote student learning and interest.

Interviews with Kumeyaay plant specialists will be conducted. I currently teach with an indigenous instructor who trained under the last Kumeyaay medicine woman, who recently passed away. He has agreed to be my "informant" for the text. I will also utilize resources at the Kumeyaay Community College Library to further my research for the textbook.

An outline of the chapters is provided at the end of this proposal.

5. Please provide a clearly defined set of objectives and the course of action to achieve those objectives that are consistent with the purpose and nature of the proposed leave.

The objective of the project is to develop a textbook for Bio 134: Ethnobotany course. There are four main objectives for this textbook:

Objective 1: Teach core concepts of plant biology

Course of Action: Develop a text that clearly and concisely synthesizes botanical concepts utilizing an approach that is student-friendly. I have found in my years of teaching general biology that engaging students with a narrative that involves frequent use of analogies, familiar examples, and clear graphics is critical and often missing in biology textbooks. The textbook will be written in a manner that makes the information accessible to students while maintaining the scientific rigor of the material. The microscopy images will be used as innovative instructional graphics to promote student learning.

Objective 2: Document indigenous uses/relationships with the Southern California native flora
Course of Action: Interview Kumeyaay plant experts and research the uses of plants native to Southern California by indigenous peoples.

Objective 3: Develop a plant identification resource of native flora
Course of Action: Utilize the images of collected specimen and microscopy to classify plant species according to their family designations. Provide key morphological characteristics that place each species within the correct taxon.

Objective 4: Provide an affordable Ethnobotany textbook for students
Course of Action: Make textbook available to students and the community at a nominal cost on amazon kindle direct publishing website

6. Please address the feasibility of the activity by discussing:
 - a. a proposed timeline that is appropriate to the activity, and
 - 1) Develop an outline for the textbook (please see attached)
 - 2) Research scientific topics and write chapters 2 and 3 (January-February)
 - 3) Research and interview ethnobiological primary resources (have contact and agreement with "informants" –January-February)
 - 4) Write chapters 1 and 6 (February/March)
 - 5) Collect, dissect and photograph plants of interest (March/April/May –as material is available)
 - 6) Write up native plant information and match with photographed samples, chapters 4 and 5 (March-May)
 - 7) Upload textbook to amazon kindle direct publishing website (June)
 - b. the availability of appropriate resources

The Biology Department has appropriate resources including: compound and dissecting microscopes with digital microscope cameras, as well as dissecting equipment. Plant materials will be collected from Cuyamaca College's Nature Preserve.

I personally have access to Lightroom, Photoshop and Illustrator; and use these programs to develop laboratory materials for other courses on my home computer. These applications will be used for the graphics in the textbook.

Outcomes

7. Clearly describe the expected outcomes of your activity.

A textbook will be written that includes botanical and ethnobiological information about native plants within San Diego County. An emphasis of the textbook will be on the plants within Cuyamaca College's Nature Preserve and those utilized by the Kumeyaay. There will be roughly 6 chapters with around 30-50 pages per chapter for a total of ~240 pages.

8. What evidence will you submit to demonstrate achievement of your outcomes?
A textbook will be self-published and available to students at a low cost on a site such as kindle direct publishing from amazon.

Textbook Chapter Outline

Ethnobotany: A Scientific Approach to Understanding Traditional Relationships of People and Plants

Chapter 1: Introduction to the Kumeyaay/Diegueño People of Southern California and Northern Baja California

- a. Environmental history
- b. Indigenous science
- c. Plant/people relationships

Chapter 2: Introduction to plant science

- a. Tools of scientific inquiry
- b. Evolution and Kingdom Plantae
 - 1) Phylogenetic systematics
 - 2) Basis for scientific classification
 - 3) Family and species determination
- c. Botanical and traditional plant identification
- d. Natural selection versus artificial selection
- e. Different phyla of Kingdom Plantae
 - 1) Evolutionary relationships
 - 2) Key adaptations to survive a changing world
- f.) Coevolution
 - 1) Relationships and adaptations with pollinators
 - 2) Relationships and adaptations with humans

Chapter 3: Plant anatomy and development

- a. Identification of plant tissues and organs
 - 1) Plant vasculature
 - 2) Roots, stems and leaves
 - 3) Flower physiology
- b. Plant life cycle
 - 1) Identifying different stages of plant development
 - 2) Plant harvesting based on stage of development
 - 3) Primary versus secondary growth
 - 1. Lineages that show secondary growth and develop woody tissue
 - 2. Traditional and modern uses of plants for utilitarian uses

Chapter 4: Phytochemistry, plants as food and medicine

- a. Primary metabolites
 - 1) Biomolecules: Carbohydrates, lipids, proteins and nucleic acids
 - 2) Utilization by the plant
 - 3) Utilization by humans
- b. Secondary metabolites
 - 1) Three classes: terpenes, nitrogen-containing, phenolic
 - 2) Purpose within the plant
 - 3) Utilization by humans

Chapter 5: Important medicinal plant families and species

- a. Photographs, dissected images of floral parts
- b. Characteristics used for identification
- c. Kumeyaay name and identification
- d. Medicinal compounds synthesized by plant/family

Chapter 6: Plant gathering and harvesting techniques

- a. Sustainable land management
- b. Promotion of biodiversity and community health