Exhibit 3.11.4 New degree programs passed by the Academic Senate, 2004-2005

PROGRAM PROPOSAL

Proposed Name of Degree/Credential:	Bachelor of Arts in Spanish
Faculty Proposing New Program:	Terry L. Ballman, Professor of Spanish Antonio F. Jiménez Jiménez, Assistant Professor of Spanish

Review and Approval:

Signature of Proposer:_____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

1a. ***Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.***

Campus - California State University Channel Islands

Degree – Bachelor of Arts in Spanish

Implementation – Fall, 2005

1b. ***Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility***.

Program: Spanish/Languages within Multiple Programs
Division: Academic Affairs

1c. ***Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.***

Terry L. Ballman, Professor of Spanish and Chair of Multiple Programs
Antonio F. Jiménez Jiménez, Assistant Professor of Spanish

1d. ***Objectives of the proposed degree major program***.

General Objectives

- Provide students with the opportunity to earn a B.A. degree in Spanish from California State University Channel Islands
- Provide students interdisciplinary and experiential learning opportunities
- Graduate students with multicultural and international perspectives
- Provide students with the necessary skills and knowledge to enter graduate school, a teaching credential program, and the public or private sector.

Learning Objectives

- Achieve intermediate-high to advanced language proficiency in speaking, listening, reading and writing (proficiency levels are defined by the American Council on the Teaching of Foreign Languages)
- Demonstrate ways of thinking (ideas, beliefs, attitudes, values, philosophies), behavioral practices (patterns of social interactions), and the cultural products (for example, art, history, literature) of the Spanish-speaking world

1e. ***Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under***

the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

BACHELOR OF ARTS IN SPANISH

The Bachelor of Arts in Spanish consists of 34 units of course work.

Prerequisites

Spanish majors will have completed the equivalent of first year college level Spanish in high school, at a community college, or by completing SPAN 101 and SPAN 102 at CSUCI, prior to beginning the Spanish major.

Lower Division Requirements (8 units)

Students must take eight (8) units of second-year Spanish courses:
SPAN 201 Intermediate Spanish I (4), and
SPAN 202 Intermediate Spanish II (4);
-or-
SPAN 211 Spanish for Heritage Speakers I (4), and
SPAN 212 Spanish for Heritage Speakers II (4).

Upper Division Requirements (26 units)

Students with intermediate high language proficiency may begin the major by taking upper-division courses. Student proficiency will be determined according to the proficiency guidelines developed by the American Council on the Teaching of Foreign Languages, and will be assessed by the Spanish faculty. For these students, a total of 34 units of upper-division courses are required to complete the Spanish major.
All Spanish majors must complete at least 11 units of 400-level courses with a SPAN prefix.

Core (11 units):
All students must take one course from each of the following categories.
Language: SPAN 301 Advanced Spanish: Part One (3) or
SPAN 302 Advanced Spanish: Part Two (3)
Literature: SPAN 310 Introduction to Prose, Poetry and Drama (3)
Culture: SPAN 410 Civilizations and Cultures of Spain (3) or
SPAN 411 Civilizations and Cultures of Latin America (3)
Capstone: SPAN 499 Capstone in Spanish (2)

Electives (15 units):
*SPAN 301 Advanced Spanish: Part One (3) or SPAN 302 Advanced Spanish: Part Two(3)
SPAN 304 Spanish for Careers and Professions (3)

SPAN 311 Estudios literarios bilingües (3) (cross-listed as ENGL 311 Bilingual Literary Studies)
SPAN 315 Contrastive Features of Spanish and English (3)
SPAN 320 Introduction to Spanish Translation (3)
*SPAN 410 Civilizations and Cultures of Spain (3) or SPAN 411 Civilizations and Cultures of Latin America (3)
SPAN 415 Spanish Language Variation and Diversity (3)
SPAN 420 Specialized Spanish Translation (3)
SPAN 460 Masterpieces of Spanish Literature (3)
SPAN 461 Masterpieces of Latin American Literature (3)
SPAN 490 Special Topics in Spanish

*Students may choose as electives courses found in the Core, provided the 11-unit core is completed.

One of the following courses may also be chosen as an elective for the Spanish major:
ART 333/HIST 333 History of Southern California Chicano/a Art (3)
ENGL 334/HIST 334 Narratives of Southern California (3)
ENGL 453 Hispanic/Hispanic American Literature (3)
HIST 402 Southern California Chicano/a History and Culture (3)
HIST 420 History of Mexico (3)
HIST 421 Revolutionary Mexico, 1876-1930 (3)

TOTAL UNITS FOR GRADUATION

I.	General Education Requirements	48 units
II.	Lower Division Course Requirements	8 units
III.	Upper Division Requirements	26 units
IV.	Electives	32 units
V.	Title 5 Requirements	6 units
	Total Units for Graduation	**120 units**

CATALOG COURSE DESCRIPTIONS

COURSES IN THE SPANISH PROGRAM

* = existing course taught by Fall 2004
** = existing course not taught by Fall 2004
***= new, proposed course needed to initiate the program
[1] = course needed to offer during the first two years after implementation
[2] = course not counting toward Spanish major

SPAN 101 ELEMENTARY SPANISH I (4)* [2]
Four hours lecture per week

This course addresses the development of basic functional proficiency in the Spanish language. As students develop their listening, speaking, reading and writing skills, they acquire knowledge about cultural similarities and differences between the U.S. and the Spanish-speaking world. Not intended for students with more than two years of high school Spanish or credit in college level Spanish.
GenEd: C3a

SPAN 102 ELEMENTARY SPANISH II (4)* [2]
Four hours lecture per week
Prerequisite: Spanish 101 or equivalent
Addresses the development of basic functional proficiency in the Spanish language. Students develop their listening, speaking, reading and writing skills, as they acquire knowledge about cultural similarities and differences between the U.S. and the Spanish-speaking world.
GenEd: C3a

SPAN 105 ELEMENTARY SPANISH FOR K-12 TEACHERS (3)** [2]
Three hours of lecture per week
Prerequisite: SPAN 101 or equivalent
Fosters the development of basic functional proficiency in the Spanish language, with emphasis on terminology and interactions related to school settings. The course is designed for those interested in learning to better communicate with Spanish-speaking members of the school population. Topics will include: Spanish alphabet, classroom vocabulary, and communication with parents.

SPAN 201 INTERMEDIATE SPANISH I (4)*[1]
Prerequisite: SPAN 102 or equivalent
Four hours lecture per week
Through the study of the culture and civilization of the Hispanic world, students continue to develop their listening, speaking, reading and writing skills in Spanish.
GenEd: C3a and C3b

SPAN 202 INTERMEDIATE SPANISH II (4)*[1]
Four hours lecture per week
Prerequisite: SPAN 201 or equivalent
Through the study of the culture and civilization of the Hispanic world, students further develop their listening, speaking, reading and writing skills in Spanish.
GenEd: C3a and C3b

SPAN 211 SPANISH FOR HERITAGE SPEAKERS I (4)*[1]
Four hours lecture per week
Prerequisite: Consent of instructor

This course is designed for students accustomed to hearing Spanish and English at home who are able to understand much of what they hear as well as speak some Spanish, and who are interested in further developing their language skills, particularly in speaking, reading and writing. Course content will include the culture and civilization of the Hispanic world, with emphasis on the U.S.
GenEd: C3a and C3b

SPAN 212 SPANISH FOR HERITAGE SPEAKERS II (4)**[1]

Four hours lecture per week
Prerequisite: SPAN 211 or equivalent or consent of instructor
This course is designed for students accustomed to hearing Spanish and English at home who are able to understand much of what they hear as well as speak some Spanish, and who are interested in further developing their language skills, particularly in speaking, reading and writing. Course content will include the culture and civilization of the Hispanic world, with emphasis on the U.S.

SPAN 301 ADVANCED SPANISH: PART ONE (3)*[1]

Three hours lecture per week
Prerequisite: SPAN 202 or SPAN 212 or consent of instructor
Enhancement of communicative abilities in listening, speaking, reading through the examination of topics of interest in the Hispanic world. Several of the topics include cultural perspectives, ancestry and roots, and work and leisure. Student projects to include presentations, service activities and cultural portfolio.

SPAN 302 ADVANCED SPANISH: PART TWO (3)**[1]

Three hours lecture per week
Prerequisite: SPAN 202 or SPAN 212 or consent of instructor
Enhancement of communicative abilities in listening, speaking, reading and writing through the examination of topics of interest in the Hispanic world. Several of the topics include tradition and change, cultural and linguistic contrasts, and human rights and equality. Student projects to include presentations, service activities and cultural portfolio.

SPAN 304 SPANISH FOR CAREERS AND PROFESSIONS (3)**

Three hours lecture per week
Prerequisite: SPAN 301 or SPAN 302 (may be taken concurrently) or consent of instructor
Interactive study of Spanish as applied to the fields of business, education, health professions and social services. Students will learn the basic vocabulary and expressions pertaining to these fields.

SPAN 310 INTRODUCTION TO PROSE, POETRY AND DRAMA (3)**[1]

Three hours lecture per week
Prerequisite: SPAN 301 or SPAN 302 (may be taken concurrently) or consent of instructor
This is an introductory literature course designed to develop students' ability to read, discuss and write about literary texts. Selections of poetry, prose, and drama from among Spanish, Latin American and U.S. Latino authors will be explored.

SPAN 311 BILINGUAL LITERARY STUDIES/ESTUDIOS LITERARIOS BILINGÜES (3)*
Three hours lecture per week
Prerequisite: SPAN 202 or SPAN 212 or consent of instructor
This course explores the literatures of the Americas written in two languages: English and Spanish. Course texts will include works written by bilingual U.S. authors and Latin American authors writing primarily in Spanish; genres may include novels, with a special focus on Magical Realism/el realismo mágico, short stories/cuentos, and poetry. Readings will be in the original language; class discussions will be bilingual.

SPAN 315 CONTRASTIVE FEATURES OF SPANISH AND ENGLISH (3)**[1]
Three hours lecture per week
Prerequisite: SPAN 301 or 302 or consent of instructor
Exploration of the linguistic similarities and differences of Spanish and English regarding their sound systems as well as their grammatical systems. Through this exploration of phonology, morphology and syntax, students will gain an understanding of the features of each language implicated in Second Language Acquisition.

SPAN 320 INTRODUCTION TO SPANISH TRANSLATION (3)**[1]
Three hours lecture per week
Prerequisite: SPAN 202 or SPAN 212 or consent of instructor
This course is designed to be an introduction to the history, theory, and practice of translation from Spanish to English and from English to Spanish. In the process of translating texts, students will learn strategies, techniques and principles of translation and, at the same time, increase their proficiency in Spanish.

SPAN 410 CIVILIZATIONS AND CULTURES OF SPAIN (3)**[1]
Three hours lecture per week
Prerequisite: SPAN 301 or 302 or consent of instructor
Explores the history of Spain, from the formation of Hispania to the present. Major geographical, political, religious and literary aspects of Spain will be discussed. Oral presentations will be required.

SPAN 411 CIVILIZATIONS AND CULTURES OF LATIN AMERICA (3)**[1]
Three hours lecture per week

Prerequisite: SPAN 301 or 302 or consent of instructor
Explores the history of the Spanish-speaking regions of Latin America, from pre-Columbian civilizations to the Spanish conquest to the present. Major geographical, political, religious and literary aspects of Latin American culture will be discussed. Oral presentations will be required.

SPAN 415 SPANISH LANGUAGE VARIATION AND DIVERSITY (3)***
Three hours lecture per week
Prerequisite: SPAN 315 or consent of instructor
This course provides a linguistic exploration of Spanish language variation. It explores different types of language variations, including historical change (language evolution from Latin to Spanish), geographical variation (different dialects in the Spanish speaking world), and sociolinguistic variation (based on economic class, age, gender, etc.). It also analyzes fundamental issues in bilingualism (such as Spanish-English code-switching) and other sociopolitical topics relating to the use of Spanish in the United States.

SPAN 420 SPECIALIZED SPANISH TRANSLATION (3)***[1]
Three hours lecture per week
Prerequisite: SPAN 320 or consent of instructor
Practice and critique of translations of a range of specialized material (legal, literary, business, social science, technical, and audiovisual) both from Spanish to English and from English to Spanish. Review of translation theory, methods, techniques, and problems.

SPAN 421 SPANISH FOR EDUCATORS I (3) **[2]
Three hours lecture per week
Prerequisite: Spanish 301 or Spanish 302 or consent of instructor
Prepares students to function effectively in Spanish within a school setting. Emphasis is placed on developing the Spanish fluency and vocabulary necessary for classroom and school-related community situations. Course content emphasizes the K-6 school setting. The topics include: General school-related vocabulary, Parent-teacher conferences, writing letters, Language arts and reading vocabulary, Examples of Spanish-language children's literature, Social studies and Mathematics. This course does not count toward the Spanish major.

SPAN 422 SPANISH FOR EDUCATORS II (3) **[2]
Three hours lecture per week
Prerequisite: Spanish 301 or Spanish 302 or consent of instructor
Prepares students to function effectively in Spanish within a school setting. Emphasis is placed on developing the Spanish fluency and vocabulary necessary for classroom and school-related community situations. Course content emphasizes the K-6 school setting. The topics include: General science vocabulary (parts of the body, illnesses, foods

and nutrition, animals, plants, minerals, weather, solar system), 2) General art vocabulary and brief introduction to several Spanish-language songs, including children's songs. This course does not count toward the Spanish major.

SPAN 460 MASTERPIECES OF SPANISH LITERATURE (3)***

Three hours lecture per week

Prerequisite: SPAN 301 or SPAN 302 or consent of instructor

This is an advanced literature course designed to develop reading, writing, and literary analysis. The content of the course will focus on selections of poetry, prose, and theater from literary masterpieces of Spanish Literature. Lectures, discussions, and analysis of the texts will be the center of class activities. Student projects will include both individual as well as group oral presentations and reports.

SPAN 461 MASTERPIECES OF LATIN AMERICAN LITERATURE (3)***

Three hours lecture per week

Prerequisite: SPAN 301 or SPAN 302 or consent of instructor

This is an advanced literature course that explores major Latin American Literary works. It will enhance students knowledge of Latin American Literature, history and culture. It will develop critical thinking and improve student's reading and writings skills while it broadens their Spanish language vocabulary. Class will focus on lectures, discussions, and both oral and written reports.

SPAN 490 SPECIAL TOPICS IN SPANISH (3)***[1]

Three hours lecture per week

Prerequisite: Consent of instructor

Selected topics on Spanish language, linguistics, Hispanic cultures, and literatures. Topics vary each semester. May be taken up to three times.

SPAN 499 CAPSTONE IN SPANISH (2)***[1]

Two hours seminar per week

Prerequisite: Senior standing as a Spanish major or consent of instructor

In this course, students design and complete a project that integrates prior course work with one or more of the objectives of the University's mission statement. The project may involve an interdisciplinary activity, a service learning experience, and reflect a multicultural or international perspective.

<u>COURSES OUTSIDE OF SPANISH</u>

ART 333/HIST 333 HISTORY OF SOUTHERN CALIFORNIA CHICANO/A ART (3)*

Three hours lecture per week

An exploration of the Southern California Chicano/a culture focusing on the genesis, vitality and diversity represented in the painting, sculpture and artistic traditions of Mexican American artists. Historical movements, politics, cultural trends and Mexican folklore underlying the development of this dynamic style of art will be investigated within a variety of contexts.
GenEd: C3b, D and Interdisciplinary

ENGL 334/HIST 334 NARRATIVES OF SOUTHERN CALIFORNIA (3)*
Three hours lecture/discussion per week
Ours is a region made up of many cultures which produce the one we call "Southern California." In this class we will take a historical approach to study of the narratives -- oral, written and filmed -- of Southern California. Course work may also include obtaining oral histories and compiling them.
GenEd: C2, D and Interdisciplinary

ENGL 453 HISPANIC/HISPANIC AMERICAN LITERATURE (3)*
Three hours lecture/discussion per week
Prerequisite: ENGL 449
Study of the novels and poetry written by Hispanic American authors. In order to understand the development of the literature, we will also read essays relevant to the events, issues and concerns attending the historical interactions between Hispanic/Chicano/a/Latino/a Americans and other peoples in North America. Authors writing in Spain, Mexico, Central America or South American countries may also be included in order to gain a more global perspective on the literature.

HIST 402 SOUTHERN CALIFORNIA CHICANO/A HISTORY AND CULTURE (3)*
Three hours lecture per week
Examines the cultural, economic, political, and social experience of Mexicanos of the region from the U.S. conquest to the 1990s. Particular attention is given to the interactions of this community with other ethnic and racial groups. Although designed within the disciplinary framework of history, the course utilizes literature, film, and art as mediums of learning about the culture and history of Chicano/as.
GenEd: D

HIST 420 HISTORY OF MEXICO (3)*
Three hours lecture per week
Examines the social and political history of Mexico from the period of European contact to the present. The modern phase of Mexico's history is examined in relation to the overall development of North America.

HIST 421 REVOLUTIONARY MEXICO, 1876-1930 (3)*

Three hours lecture per week
Evaluates the social and political causes and consequences of the Mexican Revolution. Particular attention is also given to the influence and intervention of the United States of America in Mexico's economic and domestic affairs.

1f. ***List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

Electives (15 units):

*SPAN 301 Advanced Spanish: Part One (3) or SPAN 302 Advanced Spanish: Part Two (3)
SPAN 304 Spanish for Careers and Professions (3)
SPAN 311 Estudios literarios bilingües (3) (cross-listed as ENGL 311 Bilingual Literary Studies)
SPAN 315 Contrastive Features of Spanish and English (3)
SPAN 320 Introduction to Spanish Translation (3)
*SPAN 410 Civilizations and Cultures of Spain (3) or SPAN 411 Civilizations and Cultures of Latin America (3)
SPAN 415 Spanish Language Variation and Diversity (3)
SPAN 420 Specialized Spanish Translation (3)
SPAN 460 Masterpieces of Spanish Literature (3)
SPAN 461 Masterpieces of Latin American Literature (3)
SPAN 490 Special Topics in Spanish

*Students may choose as electives courses found in the Core, as long as the 11-unit core is completed.

One of the following courses may also be chosen as an elective for the Spanish major:

ART 333/HIST 333 History of Southern California Chicano/a Art (3)
ENGL 334/HIST 334 Narratives of Southern California (3)
ENGL 453 Hispanic/Hispanic American Literature (3)
HIST 402 Southern California Chicano/a History and Culture (3)
HIST 420 History of Mexico (3)
HIST 421 Revolutionary Mexico, 1876-1930 (3)

CATALOG COURSE DESCRIPTIONS

COURSES IN THE SPANISH PROGRAM

* = existing courses taught by Fall 2004
** = existing courses not taught by Fall 2004
***= new proposed courses needed to initiate the program
[1] = needed to offer during the first two years after implementation

SPAN 301 ADVANCED SPANISH: PART ONE (3)*[1]

Three hours lecture per week

Prerequisite: SPAN 202 or SPAN 212 or consent of instructor

Enhancement of communicative abilities in listening, speaking, reading through the examination of topics of interest in the Hispanic world. Several of the topics include cultural perspectives, ancestry and roots, and work and leisure. Student projects to include presentations, service activities and cultural portfolio.

SPAN 302 ADVANCED SPANISH: PART TWO (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 202 or SPAN 212 or consent of instructor

Enhancement of communicative abilities in listening, speaking, reading and writing through the examination of topics of interest in the Hispanic world. Several of the topics include tradition and change, cultural and linguistic contrasts, and human rights and equality. Student projects to include presentations, service activities and cultural portfolio.

SPAN 304 SPANISH FOR CAREERS AND PROFESSIONS (3)**

Three hours lecture per week

Prerequisite: SPAN 301 or SPAN 302 (may be taken concurrently) or consent of instructor

Interactive study of Spanish as applied to the fields of business, education, health professions and social services. Students will learn the basic vocabulary and expressions pertaining to these fields.

SPAN 310 INTRODUCTION TO PROSE, POETRY AND DRAMA (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 301 or SPAN 302 (may be taken concurrently) or consent of instructor

This is an introductory literature course designed to develop students' ability to read, discuss and write about literary texts. Selections of poetry, prose, and drama from among Spanish, Latin American and U.S. Latino authors will be explored.

SPAN 311 BILINGUAL LITERARY STUDIES/ESTUDIOS LITERARIOS BILINGÜES (3)*

Three hours lecture per week

Prerequisite: SPAN 202 or SPAN 212 or consent of instructor

This course explores the literatures of the Americas written in two languages: English and Spanish. Course texts will include works written by bilingual U.S. authors and Latin American authors writing primarily in Spanish; genres may include novels, with a special focus on Magical Realism/el realismo mágico, short stories/cuentos, and poetry. Readings will be in the original language; class discussions will be bilingual.

SPAN 315 CONTRASTIVE FEATURES OF SPANISH AND ENGLISH (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 301 or 302 or consent of instructor

Exploration of the linguistic similarities and differences of Spanish and English regarding their sound systems as well as their grammatical systems. Through this exploration of phonology, morphology and syntax, students will gain an understanding of the features of each language implicated in Second Language Acquisition.

SPAN 320 INTRODUCTION TO SPANISH TRANSLATION (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 202 or SPAN 212 or consent of instructor

This course is designed to be an introduction to the history, theory, and practice of translation from Spanish to English and from English to Spanish. In the process of translating texts, students will learn strategies, techniques and principles of translation and, at the same time, increase their proficiency in Spanish.

SPAN 410 CIVILIZATIONS AND CULTURES OF SPAIN (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 301 or 302 or consent of instructor

Explores the history of Spain, from the formation of Hispania to the present. Major geographical, political, religious and literary aspects of Spain will be discussed. Oral presentations will be required.

SPAN 411 CIVILIZATIONS AND CULTURES OF LATIN AMERICA (3)**[1]

Three hours lecture per week

Prerequisite: SPAN 301 or 302 or consent of instructor

Explores the history of the Spanish-speaking regions of Latin America, from pre-Columbian civilizations to the Spanish conquest to the present. Major geographical, political, religious and literary aspects of Latin American culture will be discussed. Oral presentations will be required.

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Three hours lecture per week

Prerequisite: SPAN 315 or consent of instructor

This course provides a linguistic exploration of Spanish language variation. It explores different types of language variations, including historical change (language evolution from Latin to Spanish), geographical variation (different dialects in the Spanish speaking world), and sociolinguistic variation (based on economic class, age, gender, etc.). It also analyzes fundamental issues in bilingualism (such as Spanish-English code-switching) and other sociopolitical topics relating to the use of Spanish in the United States.

SPAN 420 SPECIALIZED SPANISH TRANSLATION (3)***[1]

Three hours lecture per week
Prerequisite: SPAN 320 or consent of instructor
Practice and critique of translations of a range of specialized material (legal, literary, business, social science, technical, and audiovisual) both from Spanish to English and from English to Spanish. Review of translation theory, methods, techniques, and problems.

SPAN 460 MASTERPIECES OF SPANISH LITERATURE (3)***
Three hours lecture per week
Prerequisite: SPAN 301 or SPAN 302 or consent of instructor
This is an advanced literature course designed to develop reading, writing, and literary analysis. The content of the course will focus on selections of poetry, prose, and theater from literary masterpieces of Spanish Literature. Lectures, discussions, and analysis of the texts will be the center of class activities. Student projects will include both individual as well as group oral presentations and reports.

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Three hours lecture per week
Prerequisite: SPAN 301 or SPAN 302 or consent of instructor
This is an advanced literature course that explores major Latin American Literary works. It will enhance students knowledge of Latin American Literature, history and culture. It will develop critical thinking and improve student's reading and writings skills while it broadens their Spanish language vocabulary. Class will focus on lectures, discussions, and both oral and written reports.

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Three hours lecture per week
Prerequisite: Consent of instructor
Selected topics on Spanish language, linguistics, Hispanic cultures, and literatures. Topics vary each semester. May be taken up to three times.

COURSES OUTSIDE OF SPANISH

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Three hours lecture per week
An exploration of the Southern California Chicano/a culture focusing on the genesis, vitality and diversity represented in the painting, sculpture and artistic traditions of Mexican American artists. Historical movements, politics, cultural trends and Mexican folklore underlying the development of this dynamic style of art will be investigated within a variety of contexts.
GenEd: C3b, D and Interdisciplinary

ENGL 334/HIST 334 NARRATIVES OF SOUTHERN CALIFORNIA (3)*

Three hours lecture/discussion per week

Ours is a region made up of many cultures which produce the one we call "Southern California." In this class we will take a historical approach to study of the narratives -- oral, written and filmed -- of Southern California. Course work may also include obtaining oral histories and compiling them.

GenEd: C2, D and Interdisciplinary

ENGL 453 HISPANIC/HISPANIC AMERICAN LITERATURE (3)*

Three hours lecture/discussion per week

Prerequisite: ENGL 449

Study of the novels and poetry written by Hispanic American authors. In order to understand the development of the literature, we will also read essays relevant to the events, issues and concerns attending the historical interactions between Hispanic/Chicano/a/Latino/a Americans and other peoples in North America. Authors writing in Spain, Mexico, Central America o South American countries may also be included in order to gain a more global perspective on the literature.

HIST 402 SOUTHERN CALIFORNIA CHICANO/A HISTORY AND CULTURE (3)*

Three hours lecture per week

Examines the cultural, economic, political, and social experience of Mexicanos of the region from the U.S. conquest to the 1990s. Particular attention is given to the interactions of this community with other ethnic and racial groups. Although designed within the disciplinary framework of history, the course utilizes literature, film, and art as mediums of learning about the culture and history of Chicano/as.

GenEd: D

HIST 420 HISTORY OF MEXICO (3)*

Three hours lecture per week

Examines the social and political history of Mexico from the period of European contact to the present. The modern phase of Mexico's history is examined in relation to the overall development of North America.

HIST 421 REVOLUTIONARY MEXICO, 1876-1930 (3)*

Three hours lecture per week

Evaluates the social and political causes and consequences of the Mexican Revolution. Particular attention is also given to the influence and intervention of the United States of America in Mexico's economic and domestic affairs.

1g. ***If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully***.

Not applicable.

1h. ***Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.***

- There is no additional course prerequisite or other criterion from the Spanish program beyond the standard admission criteria of the university.
- Students seeking admission to the Spanish degree program must be officially accepted into the CSUCI academic program.
- Students must declare themselves as B.A. in Spanish majors.
- Students must remain in good academic standing throughout the duration of their enrollment in CSUCI.
- Students must complete and fulfill the requirements of the degree program within a designated period specified by the university.

1i. ***Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.***

The special characteristics of this program are:

- It takes 120 units to complete, which ensures that full-time students can complete the program in four years.
- The major is 34 units, enabling students the opportunity to pursue a minor in another discipline or a second major.
- The course work provides interdisciplinary experience in diverse areas such as language, culture, linguistics, literature, Spanish for careers, translation, art, and history of the Spanish speaking world.
- It includes a capstone course that integrates prior course work with one or more of the objectives of the University's mission statement.
- The program is very flexible, in that only 11 units are required from the upper division core with the remaining 15 units as electives.
- The program allows students to prepare for a wide range of career pathways after graduation so that they could go to graduate school, pursue any teaching credential program or go into careers in the public and private sectors.

1j. ***For undergraduate programs, provisions for articulation of the proposed major with community college programs.***

The lower division core courses in the CSUCI Spanish program adhere to the normal standards widely accepted at colleges and universities across the United States. Community colleges in the CSUCI service area have been consulted, and an on-going dialogue among the campuses will ensure smooth transition for the transfer student. Formal articulation agreements, such as CAN, are currently in place.

1k. ***Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.***

Not applicable.

2. Need for the Proposed Degree Major Program

2a. ***List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.***

CSU Bakersfield	CSU Los Angeles	CSU San Jose
CSU Chico	CSU Northridge	CSU San Luis Obispo
CSU Dominguez Hills	CSU Pomona	CSU San Marcos
CSU Fresno	CSU Sacramento	CSU Sonoma
CSU Fullerton	CSU San Bernardino	CSU Stanislaus
CSU Humboldt	CSU San Diego	
CSU Long Beach	CSU San Francisco	

CSU Monterey Bay offers a concentration in Spanish. The only other CSU campus not offering a Spanish degree is the Maritime Academy.

UC Santa Barbara, California Lutheran, and Pepperdine are the nearest non-CSU universities offering Spanish degrees.

2b. ***Differences between the proposed program and programs listed in Section 2a above.***

The CSUCI's Spanish program is similar to those listed in Section 2a in significant ways. It is important that our students obtain a solid foundation in Spanish language, literature and Hispanic culture. Many of the required or core courses in the program are like those in the curricula of the above-mentioned universities.

The CSUCI program is distinctive in a number of ways. First, the program offers a wide variety of course work that no only focuses on language, literature and culture, but also on linguistics, translation and Spanish for careers. In addition, students can also take one related course from the English, art or history programs. Second, it includes a capstone course that supports the CSUCI's mission statement as students have to work on projects that involve an interdisciplinary activity, a service learning experience, and/or reflect a multicultural or international perspective. Lastly, the program emphasizes the practical applications of Spanish in order to prepare students for the needs of the job market (e.g., Spanish for careers, translation, etc.).

2f. ***Professional uses of the proposed degree major program.***

Knowledge of Spanish language and culture offers students a competitive edge in such fields as education, social work, international affairs, health care, law, library science, translation, journalism, municipal services, advertising, media, social sciences, international finance and banking, and the rapidly expanding world of international business. These fields, and many others, increasingly seek candidates who possess Spanish language ability and cultural knowledge and sensitivity.

2g. ***The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.***

	Number of Majors	Number of Graduates
Initiation Year	15	0
Third year	35	20
Fifth year	50	40

3. Existing Support Resources for the Proposed Degree Major Program

3a. ***Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program***.

Terry L. Ballman
Professor of Spanish
Ph. D. in Spanish 1985
Spanish Professor since 1985
Experience in Spanish language acquisition and second/foreign language teaching.

Antonio F. Jiménez Jiménez
Assistant Professor of Spanish
Ph. D. in Spanish 2003
Spanish Professor since 2003
Experience in Spanish language acquisition, and translation.

Other CSUCI full-time faculty listed below are involved in teaching some of the relevant courses:

Frank P. Barajas
Assistant Professor of History

Ph. D. in History 2001
History Professor since 2001
Experience in California history, Chicano studies, and twentieth century United States history.

Rainer F. Buschmann
Assistant Professor of History
Ph.D. in History 1999
History Professor since 1999
Experience in European, Pacific, world histories, and teacher education.

Renny Christopher
Professor of English
Ph. D. in Literature 1992
English Professor since 1992
Experience in twentieth century multicultural U. S. literature, working-class studies, gender studies.

Irina D. Costache
Associate Professor of Art History
Ph. D. in Art History 1993
Art History Professor since 1993
Experience in art history and humanities.

Joan K. Peters
Assistant Professor of English
Ph.D. in Comparative Literature 1974
Experience in seventeenth century English and European literature, modern and contemporary fiction, women's studies.

Jack Reilly
Professor of Fine Arts
MFA 1977
CSU Professor since 1987
Experience in museum and gallery exhibitions, public art and digital art.

4. Additional Support Resources Required

4b. ***Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.***

It is assumed that adjunct lecturers will be hired to teach some of the basic courses and, perhaps, in areas of specialization. All adjuncts who teach for the Spanish program will have a minimum of a Master's Degree and successful teaching experience.

4c. ***The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy***.

Neither additional lecture nor laboratory space is required.

4d. ***Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.***

No additional library resources needed above the existing CSUCI Library acquisition program.

4e. ***Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.***

No additional equipment or specialized materials expected.

5. Abstract of the Proposal and Proposed Catalog Description

SPANISH

PROGRAMS
•Major in Spanish
•Minor in Spanish

The Spanish program at CSUCI provides students the opportunity to develop their Spanish-language skills while deepening their knowledge and appreciation of the peoples and cultures of the Hispanic world. Spanish is the first language of approximately 400 million people in 21 countries. Hispanic cultures and peoples form an integral part of U.S. history and society, and Spanish is the most prevalent second language in California and in most regions of the country.

Being bilingual is a tremendous asset and can open doors to students entering numerous occupations and careers, such as advertising, agriculture, business, government, health services, interpreting, journalism, law, public relations, social services, teaching, translation, and the travel industry. These fields, and many others, increasingly seek candidates who possess Spanish language ability and cultural sensitivity. The program addresses the needs of students by preparing them for an increasingly pluralistic and globally oriented society, as well as a competitive career world.

The B.A. in Spanish is thirty-four (34) units, providing students the opportunity to pursue a minor in another discipline or even a second major. The Spanish minor is twenty (20)

units. Students can choose course work that focuses on language, culture, linguistics, literature, Spanish for careers, translation, and art or history. All courses with a SPAN prefix are taught in Spanish so that students develop proficiency in the language. Spanish majors and minors are encouraged to participate in a study abroad program.

CONTACT INFORMATION

FACULTY:

Terry Ballman, Ph.D., Professor of Spanish
Phone: (805) 437-8996
E-mail: terry.ballman@csuci.edu

Antonio Jiménez Jiménez, Ph.D., Assistant Professor of Spanish
Phone: (805) 437-8501
E-mail: antonio.jimenez@csuci.edu

REQUIREMENTS FOR THE MAJOR IN SPANISH (34 units)

Prerequisites:
Spanish majors will have completed the equivalent of first year college level Spanish in high school, at a community college, or by completing SPAN 101 and SPAN 102 at CSUCI, prior to beginning the Spanish major.

Lower Division Requirements (8 units):
Students must take eight (8) units of second-year Spanish courses:
SPAN 201 Intermediate Spanish I (4), and
SPAN 202 Intermediate Spanish II (4);
-or-
SPAN 211 Spanish for Heritage Speakers I (4), and
SPAN 212 Spanish for Heritage Speakers II (4).

Upper Division Requirements (26 units):
Students with intermediate high language proficiency may begin the major by taking upper-division courses. Student proficiency will be determined according to the proficiency guidelines developed by the American Council on the Teaching of Foreign Languages, and will be assessed by the Spanish faculty. For these students, a total of 34 units of upper-division courses are required to complete the Spanish major.
All Spanish majors must complete at least 11 units of 400-level courses with a SPAN prefix.

Core (11 units):
All students must take one course from each of the following categories.
Language: SPAN 301 Advanced Spanish: Part One (3) or
SPAN 302 Advanced Spanish: Part Two (3)
Literature: SPAN 310 Introduction to Prose, Poetry and Drama (3)

Culture: SPAN 410 Civilizations and Cultures of Spain (3) or
SPAN 411 Civilizations and Cultures of Latin America (3)
Capstone: SPAN 499 Capstone in Spanish (2)

Electives (15 units):

*SPAN 301 Advanced Spanish: Part One (3) or SPAN 302 Advanced Spanish: Part Two (3)
SPAN 304 Spanish for Careers and Professions (3)
SPAN 311 Estudios literarios bilingües (3) (cross-listed as ENGL 311 Bilingual Literary Studies)
SPAN 315 Contrastive Features of Spanish and English (3)
SPAN 320 Introduction to Spanish Translation (3)
*SPAN 410 Civilizations and Cultures of Spain (3) or SPAN 411 Civilizations and Cultures of Latin America (3)
SPAN 415 Spanish Language Variation and Diversity (3)
SPAN 420 Specialized Spanish Translation (3)
SPAN 460 Masterpieces of Spanish Literature (3)
SPAN 461 Masterpieces of Latin American Literature (3)
SPAN 490 Special Topics in Spanish

*Students may choose as electives courses found in the Core, provided the 11-unit core is completed.

One of the following courses may also be chosen as an elective for the Spanish major:

ART 333/HIST 333 History of Southern California Chicano/a Art (3)
ENGL 334/HIST 334 Narratives of Southern California (3)
ENGL 453 Hispanic/Hispanic American Literature (3)
HIST 402 Southern California Chicano/a History and Culture (3)
HIST 420 History of Mexico (3)
HIST 421 Revolutionary Mexico, 1876-1930 (3)

REQUIREMENTS FOR THE MINOR IN SPANISH (20 units)

Lower Division Requirements (8 Units)
SPAN 201 Intermediate Spanish I (4), and
SPAN 202 Intermediate Spanish II (4);
or
SPAN 211 Spanish for Heritage Speakers I (4), and
SPAN 212 Spanish for Heritage Speakers II (4).

Upper Division Requirements (12 units)
Select Four (4) Courses from the Following:
SPAN 301 Advanced Spanish: Part One (3)
SPAN 302 Advanced Spanish: Part Two (3)
SPAN 304 Spanish for Careers and Professions (3)
SPAN 310 Introduction to Prose and Poetry (3)
SPAN 311/ENGL 311 Bilingual Literary Studies/Estudios literarios bilingües (3)

SPAN 315 Contrastive Features of Spanish and English (3)
SPAN 320 Introduction to Spanish Translation (3)
SPAN 410 Civilizations and Cultures of Spain (3)
SPAN 411 Civilizations and Cultures of Latin America (3)
SPAN 415 Spanish Language Variation and Diversity (3)
SPAN 420 Specialized Spanish Translation (3)
SPAN 421 Spanish for Educators I (3)
SPAN 422 Spanish for Educators II (3)
SPAN 460 Masterpieces of Spanish Literature (3)
SPAN 461 Masterpieces of Latin American Literature (3)
SPAN 490 Special Topics in Spanish (3)
ART 333/HIST 333 History of Southern California Chicana/o Art (3)

New Program Consultation Sheet

Program Title: _____

Recommend Approval

Program Area/Unit	**Program/Unit Chair**	**YES**	**NO** (attach objections)	**Date**
Art				
Biology				
Business & Economics				

Education				
English				
History				
Liberal Studies				
Mathematics & CS				
Multiple Programs				
Psychology				
Library				
Information Technology				

BS in Information Technology (offered through Extended Education)

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005

(LONG FORM)

Proposed Name of Degree: Bachelor of Science in Information Technology

Options/ Emphases in the Degree:

Faculty Proposing New Program: Peter Smith, William Wolfe, Ivona Grzegorczyk

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

PROCEDURE FOR SUBMITTING PROPOSALS FOR NEW PROGRAMS

1. Definition of the Proposed Degree Major Program

a. Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.

California State University Channel Islands
Bachelor of Science in Information Technology
Fall 2005

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Computer Science.

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

William Wolfe, PhD
Professor of Computer Science

Peter Smith, PhD
Professor of Computer Science

Ivona Grzegorczyk, PhD
Professor of Mathematics

d. Objectives of the proposed degree major program.

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems. The BSIT sits between a BS in Computer Science and a BS in Management Information Systems, emphasizing the fastest growing segments of the both: Web Systems, Databases, and Networks. For a foundation, the BSIT program draws from both camps: mathematics, science, and computer programming from Computer Science, and business organization and project management from Management Information Systems. From there it adds depth in Web Programming and Technology, Database Theory and Design, and Data Communications and Networking, while allowing for further depth in these or related areas such as e-Commerce, Computer Security, and Multimedia.

e. Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

BSIT Program Requirements

A total of 120 Semester units are required for the BSIT.

Lower Division Requirements (60 units)

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

a. Statistics.
b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
c. First course in a computer programming language such as C, Java or C++.
d. First course in Computer Architecture and Assembly Language.
e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these 60 units prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

(Continued on the next page).

(section 1e, continued)

Upper Division Requirements:

Mathematics and Science Requirements (7 Units)

Math	300	Discrete Mathematics I	3	
Lab Science	II	(Physics, Chem., or Bio.)	4	
			7	

Core Courses (24 Units)

IT	151	Data Structures for IT	3	
IT	262	Computer Organization for IT	3	
IT	280	Web Programming		3
IT	429	Computer Networks for IT	3	
IT	420	Database Theory and Design for IT	3	
IT	362	Operating Systems for IT	3	
CIS	310	Management Information Systems	3	
MGT	320	Management of Organizations	3	
			24	

Upper Division Interdisciplinary GE (9 Units)

As a graduation requirement, all CSUCI students must complete 48 units of General Education. Nine of the 48 units must be resident upper division, interdisciplinary courses numbered in the 330-349 or 430-439 ranges.

Electives (15 units)

Choose 15 units from:

IT	400 eCommerce	3	
IT	401Web Intelligence	3	
IT	424 Computer System Security for IT		3
IT	402 Advanced IT Programming	3	
IT	464 Computer Graphics for IT	3	
IT	469 AI and Neural Networks for IT	3	
IT	430 Advanced DB Systems		3
IT	490 Special Topics for IT	3	
COMP	452 Computational Bioinformatics	4	
ART	324 Commun. Design Technology: Web Design		3
ART	326 Digital Media Art: 3D Computer Animation		3
(Additional electives to be added based on faculty availability).			
		15	

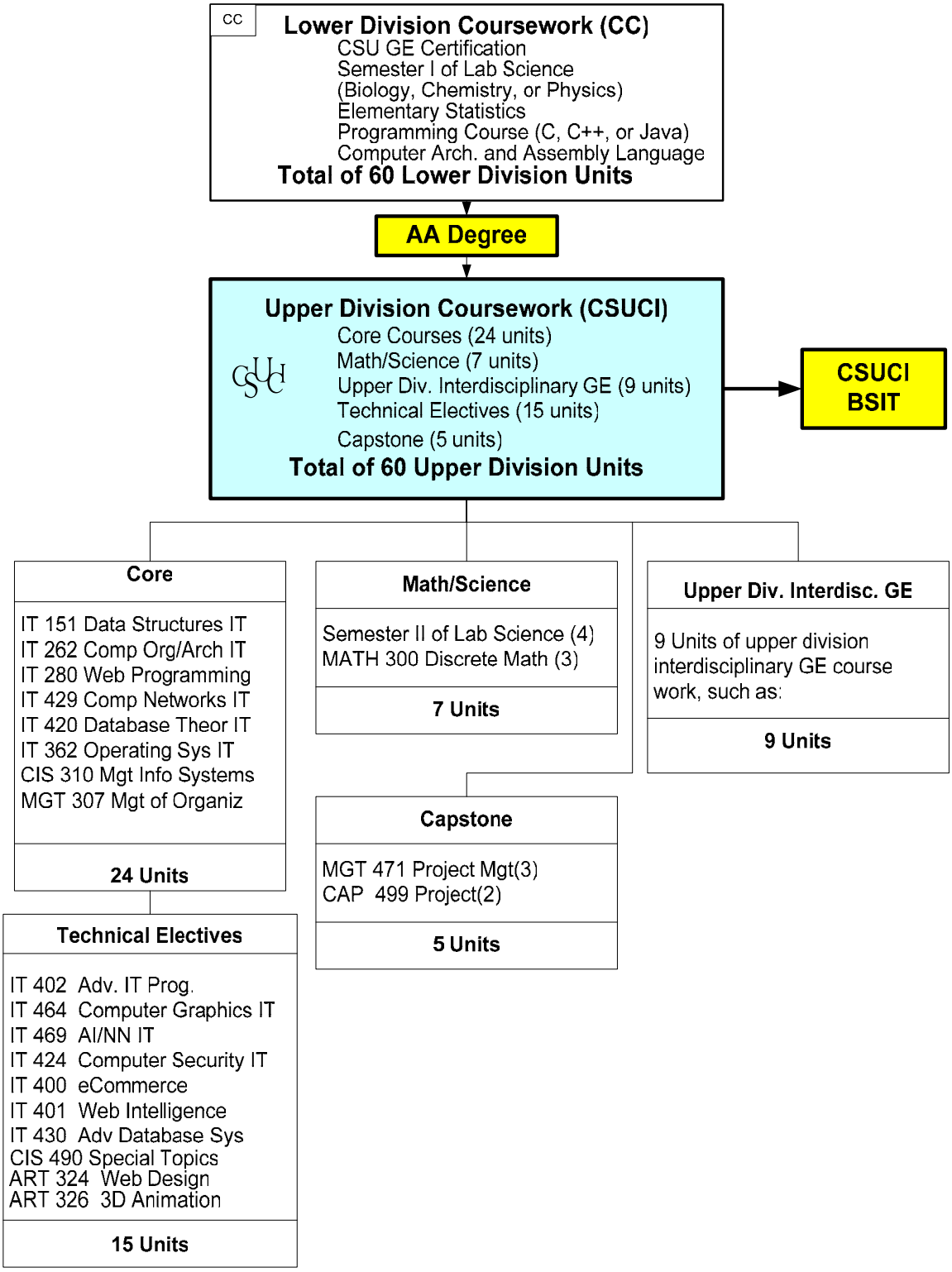
Capstone (5 units)

MGT	471 Project Management	3	
IT	499 Capstone Project	2	
		5	

BSIT Summary (120 units)

Lower Division Requirements	(units: 60)
Mathematics and Science Requirements	(units: 7)
Core Courses	(units: 24)
Upper Division Interdisciplinary GE	(units: 9)
Upper Division Electives	(units: 15)
Capstone	(units: 5)
	120

(section 1e, continued)



(section 1e, continued)
Catalog Descriptions of New Courses:

IT 151 Data Structures for IT (3)
Three hours of lecture in the lab per week.Introduction to data structures and the algorithms that use them. Review of composite data types such as arrays, records, strings and sets. Topics include: abstract data types, stacks, queues, linked lists, trees and graphs, recursion, and time complexity. Course designed for IT majors.
Prerequisites: COMP 150 First course in programming (C, C++, or Java).

IT 262 Computer Organization and Architecture for IT (3)
Overview of main system components: CPU, main memory, secondary memory, input/output. Data representation. Digital logic. PC Architecture. CISC and RISC. RAM and cache memories. Disks and RAID. Instruction set design. Input/Output and bus technology. Other architectures. Benchmarking. Trends in computer architecture. Three hours of lecture per week.
Prerequisites: COMP 162

IT 280 Web Programming (3)
Three hours of lecture in the lab. This course provides an overview of the many languages and techniques used in web progamming. This includes Java, JavaScript, PHP, Python, Perl, JSP and ASP, as well as database query languages and XML. Sample applications are built for dynamic web pages and web sites.
Prerequisites: MATH 300 IT 151

IT 362 Operating Systems for IT (3)
Examination of the principal types of operating systems including batch, multi-programming, and time-sharing. Networked systems are also discussed. The salient problems associated with implementing systems are considered including interrupt or event driven systems, multi-tasking, storage and data base management, and input-output. Role and tasks of system administrator. System management tools. Case analysis of systems such as DOS/Windows, Linux/Unix, VMS. Projects will be implemented to reinforce the lectures.
Prerequisites: IT 262

IT 400 eCommerce (3)
Three hours of lecture in the lab.
Fundamentals of database driven web sites. Online accounts, cookies, shopping carts, data collection and storage, and data security. Covers user interface design, navigation and site search strategies and database support.
Prerequisites: IT 280 IT 420

IT 401 Web Intelliegence (3)
Three hours of lecture in the lab.
Using web programming to extract information, using intelligent search engines, artificial intelligence techniques (expert systemts, agents). Topics include: data mining, data warehousing, natural language processing, decision support systems, and intelligent agents.
Prerequisites: IT 402 Advanced IT Programming.

IT 402 Advanced IT Progamming (3)
Three hours of lecture in the lab. Covers a variety of programming languages, including java, c, c++, perl, asp, and php. This course focuses on building applications that are useful to IT professionals, such as applications for network security, maintenance and surveillance.
Prerequisites: IT 280

(section 1e, continued)

IT 420 Database Theory and Design for IT (3)
Three hours of lecture in the lab per week.
Database structure including: structure definition, data models, semantics of relations, and operation on data models. Database schemas: element definition, use and manipulation of the schema. Elements of implementation. Algebra of relations on a database. Hierarchical data bases. Discussion of information retrieval, reliability, protection and integrity of databases.
Prerequisites: MATH 300

IT 424 Computer System Security for IT (3)
Security techniques and practices in operating systems,databases and computer networks.Analysis of formal security models. Introduction to the OSI Security Architecture, cryptography, public key security systems and firewalls.
Prerequisites: IT 429

IT 429 Computer Networks for IT (3)
Basic software design and analysis considerations in networking computers into coherent, cooperating systems capable of processing computational tasks in a distributed manner. Network topology, routing procedures, message multiplexing and process scheduling techniques.
Prerequisites: IT 362

IT 464 Computer Graphics for IT (3)
Three hours of lecture in the lab per week.
Fundamental concepts of computer graphics. Graphics devices; graphics languages; interactive systems. Applications to art, science, engineering and business. Trade-offs between hardware devices and software support.
Prerequisites: MATH 300 IT 151

IT 469 Artificial Intelligence/Neural Networks for IT (3)
Three hours of lecture in the lab per week.
An exploration of the use of computers to perform computations normally associated with intelligence, pattern formation and recognition using various backpro iterations. Stacks, decision trees and other modern mining tools and computational models for knowledge representation will be covered. Other topics may include natural language and imaging.
Prerequisites: MATH 300 IT 151

IT 472 BSIT Capstone (2)
Implement a realistic Information Technology project. Identify project goals in consultation with an industry representative. Produce the project requirements, design and complete documentation. Implement the project design, test and debug the system. Present the project results to the class and the industry representative. Work in teams.
Prerequisites: MGT 4xx Senior standing in the BSIT program.

IT 490 Special Topics for IT (3)
The course addresses current issues in Information Technology. Specialized topics will be studied. May be repeated as topics change.
Prerequisites: (No specific course.) Senior standing in the BSIT program.

f. List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

The course listings in section 1e provide this information.

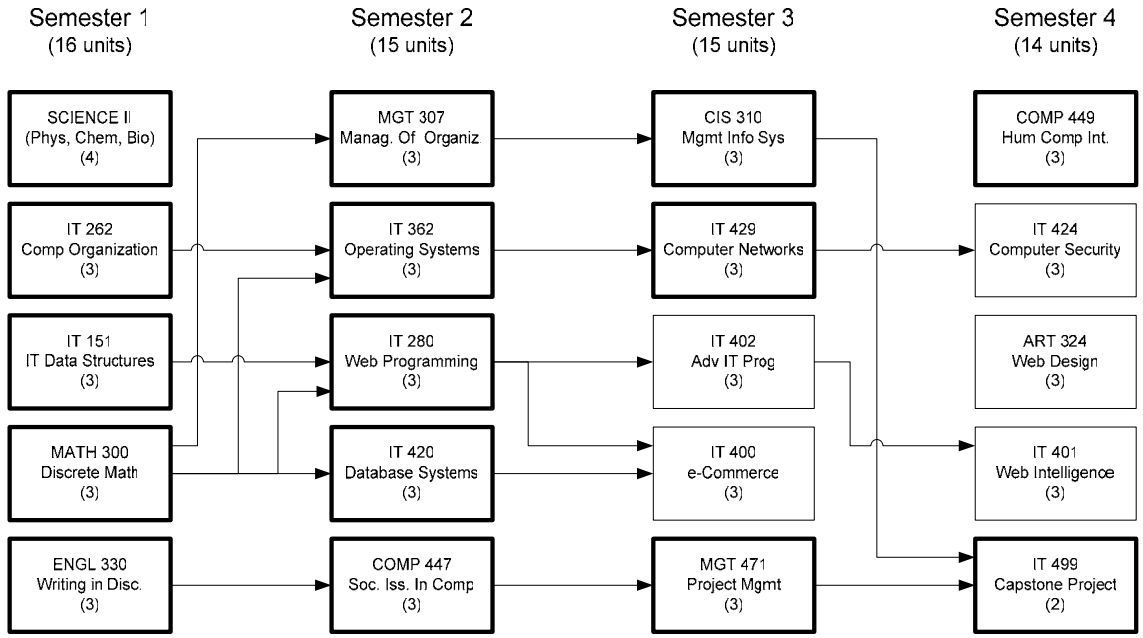
g. If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.

It is expected that the student will select electives that emphasize one of the following themes: Web Technology, Computer Security, Database Systems, or Network and Computer Architectures.

Each student will consult with the BSIT advisor and select the appropriate available courses as they add depth in any of these areas.

For example, a student entering the BSIT program is expected to have already satisfied the lower division requirements described earlier, typically at a community college. The two years of upper division course work: (see figure on next page).

Typical BSIT Plan of Study
(Emphasis in Web Technology)



Notes
1. The bold boxes are required courses.
2. Thin line boxes are electives.
3. Lines and arrows indicate prerequisites.

h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.

BSIT Prerequisites:

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

a. Statistics.
b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
c. First course in a computer programming language such as C, Java or C++.
d. First course in Computer Architecture and Assembly Language.
e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these 60 units prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

i. Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems.

CSUCI is working closely with the local community colleges on this project. The CC's feel strongly that a BSIT at CSUCI is in big demand, and that it will help to strengthen their technology programs, which typically reach a dead end at the Associate's level. The CC's have worked with CSUCI to build a program that will provide many of their technology students a clear path to a 4 year degree.

j. For undergraduate programs, provisions for articulation of the proposed major with community college programs.

CSUCI has worked closely with the local CC's and have identified the basic articulation requirements.

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

a. Statistics.
b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
c. First course in a computer programming language such as C, Java or C++.
d. First course in Computer Architecture and Assembly Language.
e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these requirements prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

k. Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.

The program is designed in accordance with the major accrediting body ABET:

Accreditation Board for Engineering and Technology, Inc.
111 Market Pl., Suite 1050
Baltimore, MD 21202
(410) 347-7700
(410) 625-2238 (Fax)

Currently, ABET has specific accreditation criteria for Information Systems and Software Engineering, but not for Information Technology. A subcommittee of the ACM (Association of Computing Machinery), the special interest group on information technology education (SIGITE), is currently working on the criteria. Professor Wolfe is on that committee. The committee will meet on October 28, 2004, in Salt Lake City, Utah, and Professor Wolfe will attend the meeting to be sure that our program meets the criteria when it is finally published.

We expect to apply for ABET accreditation in Information Technology in Fall of 2008.

2. Need for the Proposed Degree Major Program

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

We know of no other CSU campus that offers a BSIT, although there is a BS Information Systems program offered at CSUN, College of Business and Economics, in the Department of Accounting and Information Systems, that has some similarities.

We know of no other local institution that offers a BSIT program.

b. Differences between the proposed program and programs listed in Section 2a above.

The CSUN degree is a B.S. in Information Systems with an option in Information Technology, it is not an Information Technology degree. It is a combination of computer science and business courses. There are also courses referred to as IS courses. However, the main focus is "business" since that is the school offering the course work.

Furthermore, the CSUCI BSIT program is designed to be compatible with the lower division technology programs being offered in community colleges across the state of CA. The CSUN program has many lower division requirements, such as Engineering Calculus, that those technology students do not typical have.

Similarly, local institutions that offer related degrees, such as Information Systems, are heavily vested in Business courses, as opposed to Technology courses.

f. Professional uses of the proposed degree major program.

Potential career option for BSIT graduates include: Computer Systems Integrator, Computer Systems Manager, Information Technology Designer, Information Technology Support, Database Systems Manager, Database Systems Designer, Data Communications Analyst, Network Manager, Network Designer, Web Technology Manager, Web Technology Support.

Information technology continues to be at the backbone of all business enterprises. Although there are computer science programs and business programs that provide support for this high demand area, there are no programs that fill the gap between the highly analytical/theoretical computer science programs and the mostly managerial business programs. In particular, this BSIT program will provide an avenue of advancement for the many students graduating from the community colleges with technology oriented degrees.

The BSIT is meant to satisfy a community/regional/statewide need for a program that emphasizes the fast growing segments of enterprises: Web Technology, Databases, and Networks. For a foundation, the BSIT program draws from: basic mathematics, science, and computer programming from Computer Science, and basic business organization and project management from Management Information Systems. From there it adds depth in Web Technology, Database Theory and Design, and Data Communications and Networking, while allowing for area concentrations in any of these or related areas such as e-Commerce, Computer Security, and Multimedia.

Also:

1. Network systems and data communications analysts are projected by the Bureau of Labor Statistics to be the second fastest growing occupation over the period from 2002 to 2012. See: http://www.bls.gov/news.release/ecopro.t04.htm

2. Computer systems design and related services, and Internet services, data processing and other information services are two industries with the fastest projected wage and salary growth between 2002 and 2012. See: http://www.bls.gov/news.release/ecopro.t03.htm

3. Employment in computer and mathematical occupations is expected to grow over 34% in the period from 2002 to 2012. This is the highest projected growth of all major occupational groups as specified by the Bureau of Labor Statistics. See: http://www.bls.gov/news.release/ecopro.t02.htm

g. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	Number of Majors	Number of Graduates
Initiation Year	20	0
Third year	60	40
Fifth year	150	80

(from CSU Channel Islands Enrollments Models)

3. Existing Support Resources for the Proposed Degree Major Program

a. Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program.

BRIEF FACULTY BIOGRAPHIES (up to 3 relevant publications listed).

Ivona Grzegorczyk
Professor of Mathematics
PhD in Mathematics, UC Berkeley, 1990
Mathematics Professor since 1990
Extensive experience in the areas of algebraic geometry, moduli problems, applied mathematics, mathematics education.

Selected publications:
1. On Newstead's Conjecture on Vector Bundles on Algebraic Curves, Mathematichen Annallen 300, 521-541(1994).
2. Mathematics and Fine Arts, Kendall/Hunt publishing Co., (2000) .
3. Geography of Brill-Noether Loci for Small Slopes (with L. Brambila-Paz and P. Newstead), Journal of Algebraic Geometry. 6 (1997).

Peter Smith
Professor of Computer Science
PhD in Computer Studies, Lancaster University, 1975
Computer Science Professor since 1980
Extensive experience in the areas of data structures and algorithms

Selected publications:
1. Applied Data Structures with C++ , Jones and Bartlett, 2004
2. Experiments with word-by-word compression of English text using lexicons, **Computer Journal**, 1992.
3. Experiments with a very fast substring search algorithm, **Software-Practice and Experience**, 1991.

William Wolfe
Professor of Computer Science
PhD in Mathematics, CUNY, 1976
Computer Science Professor since 1988
Extensive experience in Neural Networks, Artificial Intelligence, Databases.

Selected publications:
1. Student Peer Reviews in an Upper Division Mathematics Class, **Exchanges**: The Online Journal of Teaching and Learning in the CSU, September
2. Thee Scheduling Algorithms Applied to the Earth Observing Systems Domain **INFORMS Journal on Management Science**, Vol. 46, No. 1, January 2000 pp. 148-
3. A Fuzzy Hopfield-Tank TSP Model **INFORMS Journal on Computing**, Vol. 11, No. 4, Fall 1999 pp. 329-

Geoffrey Dougherty
Professor of Physics
Ph.D. in Biophysics, University of Keele, 1979
Medical Imaging/Physics Professor since 1986
Extensive experience in medical imaging, image analysis, and bioengineering.

Selected publications:
1. Dougherty, G and Henebry, G. Lacunarity analysis of spatial pattern in CT images of vertebral bone for assessing osteoporosis. Med. Eng. Phys., 2002, **24**, 129-138.

2. Dougherty, G. and Kawaf Z. The point spread function revisited: image restoration using 2-D convolution. Radiography, 2001, **7**, 255-262.
3. Dougherty, G. and Henebry, G. Fractal signature and lacunarity in the measurement of the texture of trabecular bone in clinical CT images. Med. Eng. Phys., 2001, **23**, 369-380.

Jesse Elliot
Assistant Professor of Mathematics
PhD in Mathematics, UC Berkeley, 2003
Mathematics Professor since 2003
Experience in commutative algebra and number theory.

Selected publications:
1 Witt-Burnside Rings (dissertation), UC Berkeley, 2003
2 Binomial Rings (preprint on website)

Jorge Garcia
Assistant Professor of Mathematics
PhD in Mathematics, U-W Madison, 2002
Mathematics Professor since 2002
Extensive experience in Stochastic Processes, Large Deviations, Stochastic Integrals, Probability, Markov Processes and Measure Theory.

Selected publications:
1. An Extension of the Contraction Principle, Journal of Theoretical Probability, October, 2003
2. A Large Deviation Principle for Stochastic Integrals (In Preparation)

- Three additional full-time professors in the Computer Science and Mathematics areas are planned for Fall 2005
- Other CSUCI full-time science faculty will offer interdisciplinary and computation intensive application courses.

This program will require classroom space, computer laboratory space, library materials, library electronic databases and the use of Information Technology (IT) resources.

4. Additional Support Resources Required

b. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.

Ph.D. degrees in Computer Sciences or closely related fields. Since this is a "self support" program, all hiring of additional faculty will be handled via the Office of Extended Education

c. The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

This program will be offered as "self support" and therefore all additional lab space will be negotiated for a price through the Office of Extended Education. Since all students are going to be technology literate, some of the courses (or part if the courses) will be offered on-line. This would give the opportunity for local working professionals to participate in the program.

d. Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.

No additional library resources needed above the existing CSUCI Library acquisition program.

e. Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

Computer lab equipment will be rented or purchased via the Office of Extended Education and will therefore not have an impact on exiting CSUCI labs.

5. Abstract of the Proposal and Proposed Catalog Description

BSIT PROGRAM (CATALOG DESCRIPTION)

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems. The BSIT sits between a BS in Computer Science and a BS in Management Information Systems, emphasizing the fastest growing segments of the both: Web Systems, Databases, and Networks. For a foundation, the BSIT program draws from both camps: mathematics, science, and computer programming from Computer Science, and business organization and project management from Management Information Systems. From there it adds depth in Web Programming and Technology, Database Theory and Design, and Data Communications and Networking, while allowing for further depth in these or related areas such as e-Commerce, Computer Security, and Multimedia. Students entering this program are expected to have already attained an associates degree in a technology area (or the equivalent), with at least 30 units that are "GE certified" for the CSU system, including courses in: Statistics, First Course in a Laboratory science (Physics, Chemistry, or Biology), First course in a programming language (such as C, Java, or C++), Computer Architecture and Assembly Language.

CAREERS: Potential career option for BSIT graduates include: Computer Systems Integrator, Computer Systems Manager, Information Technology Designer, Information Technology Support, Database Systems Manager, Database Systems Designer, Data Communications Analyst, Network Manager, Network Designer, Web Technology Manager, Web Technology Support.

CONTACT INFORMATION
compsci.csuci.edu

FACULTY
Peter Smith, Ph. D.

Professor of Computer Science
Academic Advisor for Information Technology
Bell Tower 2200
peter.smith@csuci.edu
805-437-8882

William Wolfe, Ph. D.
Professor of Computer Science
Computer Science Program Chair
Bell Tower 2225
william.wolfe@csuci.edu
805-437-8985

REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (120 UNITS)

Lower Division Requirements

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

a. Statistics.
b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
c. First course in a computer programming language such as C, Java or C++.
d. First course in Computer Architecture and Assembly Language.
e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these 60 units prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

Upper Division Requirements:

Mathematics and Science Requirements (7 Units)

Math	300	Discrete Mathematics I	3	
Lab Science	II	(Physics, Chem., or Bio.)	4	
			7	

Core Courses (24 Units)

IT	151	Data Structures for IT	3	
IT	262	Computer Organization for IT	3	
IT	280	Web Programming		3
IT	429	Computer Networks for IT	3	
IT	420	Database Theory and Design for IT	3	
IT	362	Operating Systems for IT	3	
CIS	310	Management Information Systems	3	
MGT	307	Management of Organizations	3	
			24	

Upper Division Interdisciplinary GE (9 Units)

As a graduation requirement, all CSUCI students must complete 48 units of General Education. Nine of the 48 units must be resident upper division, interdisciplinary courses numbered in the 330-349 or 430-439 ranges.

Electives (15 units)

Choose 15 units from:

IT	400 eCommerce	3	
IT	401Web Intelligence	3	
IT	424 Computer System Security for IT		3
IT	402 Advanced IT Programming	3	
IT	464 Computer Graphics for IT	3	
IT	469 AI and Neural Networks for IT	3	
IT	430 Advanced DB Systems		3
IT	490 Special Topics for IT	3	
COMP	452 Computational Bioinformatics	4	
ART	324 Commun. Design Technology: Web Design		3
ART	326 Digital Media Art: 3D Computer Animation		3

(Additional electives to be added based on faculty availability).

15

Capstone (5 units)

MGT	471 Project Management	3
IT	499 Capstone Project	2
		5

BSIT Summary (120 units)

Lower Division Requirements	(units: 60)
Mathematics and Science Requirements	(units: 7)
Core Courses	(units: 24)
Upper Division Interdisciplinary GE	(units: 9)
Upper Division Electives	(units: 15)
Capstone	(units: 5)
	120

PROPOSED COURSE OF STUDY

Junior Year

Fall:
Science II (Bio, Chem, or Phys). (4)
IT 262 Computer Organization (3)
IT 151 Data Structures for IT (3)
Math 300 Discrete Mathematics (3)
Engl 330 Writing in a Discipline (3)

Spring:
MGT 307 Management of Organizations (3)
IT 362 Operating Systems for IT (3)
IT 280 Web Programming (3)
IT 420 Database Systems for IT (3)
Comp 447 Societal Issues in Computing (3)

Senior Year

Fall:
CIS 310 Management Information Systems (3)
IT 429 Computer Networks (3)
IT 402 Advanced IT Programming (3)
IT 400 e-Commerce (3)

MGT 471 Project Management (3)

Spring:
Comp 429 Human Computer Interaction (3)
IT 424 Computer System Security for IT (3)
Art 324 Web Design (3)
IT 401 Web Intelligence (3)
IT 499 Capstone Project (2)

MS in Mathematics (Offered through Extended Education)

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005

(LONG FORM)

Proposed Name of Degree: Master of Science in Mathematics

Options/ Emphases in the Degree:

Faculty Proposing New Program: Ivona Grzegorczyk, Jorge Garcia, Jesse Elliott, Peter Smith, William Wolfe, Geoff Dougherty.

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

PROCEDURE FOR SUBMITTING PROPOSALS FOR NEW PROGRAMS

A campus, in accordance with its approved academic master plan, submits detailed proposals for new degree major programs to the Office of Academic Program Planning for review and approval in the academic year preceding projected implementation. Approval of any degree major program is subject to campus assurances that financial support, qualified faculty, physical facilities and library holdings sufficient to establish and maintain the program will be available within current budgetary support levels. The proposal must follow the format below, and four copies should be sent to Academic Program Planning, Office of the Chancellor.

EXPLANATION:

With the rapid development of high-tech and computational sciences in the entire world, the need for graduate programs in computational sciences is acute. There is a global shortage of people with advanced mathematical, computational, and computer skills throughout the industry, especially in the greater Los Angeles area, and Ventura county. The MS program in Mathematics is broad in scope (applications include, Bioinformatics, Actuarial Sciences, Cryptography, Security, Image Recognition, Artificial Intelligence, Mathematics Education).
The Program will be of interest to students with undergraduate degrees in mathematical sciences, computer science, engineering, and others with strong computational background. MS degree in Mathematics is on the CSUCI Curriculum Plan as self–supporting programs scheduled to start in the Fall 2005. There is a waiting lists of students committed to apply. The program will be of service to graduates holding computational degrees, especially for professional working in local high-tech and computational industries, as well as the military personnel. We have letters from local industries in support of the program.

Our graduates will find the employment in local high-tech, information systems, and computational industries, businesses, educational institutions, military and local and federal government. Some students may elect to continue their education in various at graduate schools.

Since we are expecting a quite broad interest in our program, we propose that the program will start in the Fall 2005 as a self-supporting program, and when the university budgetary situation improves, we will offer also a state supported version.

1. Definition of the Proposed Degree Major Program

a. Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.

California State University Channel Islands
Master of Science in Mathematics
Fall 2005

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

This degree program is a result of cooperation between Mathematics and Computer Science faculty. The program will offer MS degree in Mathematics. **All** of the courses are shared between MS in Mathematics and MS in Computer Science programs, and students' specializations depend on the final project/ thesis and the electives chosen under the supervision of their Mathematics advisors.

MS in Mathematics Program would offer the program initially through the Open University (the Extended Education Program).

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Peter Smith, PhD
Professor of Computer Science

William Wolfe, PhD
Professor of Computer Science

Geoff Dougherty
Professor of Physics

Ivona Grzegorczyk, PhD
Professor of Mathematics

Jesse Elliott
Assistant Professor of Mathematics

Jorge Garcia
Assistant Professor of Mathematics

e. Objectives of the proposed degree major program.

General Objectives:

1. Provide students with the opportunity to earn a Master degree in Computer Science or Mathematics from the California State University.
2. Prepare students for employment in a variety of highly sophisticated and complex high-tech and bio-tech industries, businesses, education systems, military and local and federal government
3. Prepare students for further study in graduate or professional schools.
4. Equip students with the depth, flexibility and mathematical skills that apply to variety of fields and offer various career opportunities, including consulting, scientific and technical positions in business and industry, research and development, national and industrial security or teaching positions.
5. Offer all CSUCI students the opportunity to broaden their knowledge and learn mathematical skills and computer technology that can be applied to various professional and personal situations.

Learning Objectives:

Students will:

1. Demonstrate critical thinking, problem solving, and advanced mathematical skills by identifying, evaluating, analyzing, synthesizing and presenting fundamental and advanced mathematical and computer science issues and their applications.

2. Demonstrate the knowledge of current mathematical theories and broad technology use in industry, including a working knowledge of software development techniques in an industrial setting.

4. Be knowledgeable of emerging new technologies and industrial practices connected to the computer industry and demonstrate understanding of computing technologies in society.

5. Demonstrate cooperation skills by working effectively with others in interdisciplinary group settings – both inside and outside the classroom.

6. Demonstrate independent working and thinking skills by completing a graduate project and/or master thesis.

7. Demonstrate a sense of exploration that enables them to pursue rewarding careers in high-tech industries, bio-tech industries, businesses, education systems, military and local and federal government

8. Demonstrate flexibility, transferability and adaptability of their life-learning skills that are so important n fast changing national and international economy.

f. Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

32 Semester units required for the major.

Since CSUCI will begin admitting graduate students in Fall 2004, all courses are new and will be needed to initiate the program. These courses will be offered during the first two years (and subsequent years) after program implementation. See the following pages for Courses and Catalog Descriptions.

CORE COURSES (11 Units)

Choose 3 courses from the following list:

MATH 510 Probabilistic Methods And Measure Theory (3)
MATH 511 Functional Analysis (3)
COMP 510 Algorithms (3)
COMP 569 Artificial Intelligence (3)
PHYS 510 Advanced Image Analysis Techniques (3)

And required two units of:

Math 599 Graduate Seminar (1)

ELECTIVES (15 Units)*

Choose 5 Electives from the following list (at least 3 courses in mathematics):

Math/ COMP	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	513	3	Advanced Algebra

Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition
COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining

*other graduate or junior/senior courses may be included with advisors approval.

PROJECT OR MASTER THESIS - EMPHASIS (6 units)

Math 597 Master Thesis
or
Math 598 Master Project

TOTAL CREDITS: 32 units

COURSE DESCRIPTIONS FOR CATALOG

COMP 510 Algorithms (3)
Design strategies for algorithms and data structures. Theoretical limits to space and time requirements. Time/space trade-offs. Categories of problems and algorithms. Applications to business, bioinformatics, engineering, telecommunications and other disciplines. Open problems in the field.

COMP 520 Advanced Database Systems (3)
Three hours lecture in the lab per week.
This graduate course covers advanced analysis of Relational Database Management Systems including their design and implementation. Topics include relational algebras, Entity Relation Diagrams, first, second, and third Normal Forms, data integrity constraints, triggers, query optimization, indexing, stored procedures, distributed databases, database administration issues, transaction processing and scheduling, object oriented database modeling, and data security

COMP 524 Security (3)
Three hours lecture in the lab per week.
A survey of security issues and techniques for stand-alone and networked computer systems including databases. Techniques such as auditing, risk analysis, cost-benefit analysis. Security standards. Application in various fields.

COMP 529. Network Computing (3)
Three hours of lecture in the lab per week.
Design and programming in Java of distributed systems that use telecommunication networks as their computing platform.

COMP 532 Computational Bioinformatics (3)
Three hours of lecture in the lab per week.
Contemporary computational models used in molecular biology and structures simulations will be introduced. Topics include dynamic programming, statistical/ information techniques for pattern recognition, algorithms for string alignments, structural superposition algorithms, computing with differential information, 3D motifs, Hidden Markov Models, phylogenetic trees, genetic algorithms.

Comp 549 Human-Computer Interaction (3)
Three hours lecture in the lab per week.
The design, development and analysis of effective interfaces to computer systems. Trends in graphical user interfaces.

COMP 550. Object-Oriented Software Engineering (3)
Three hours of lecture in the lab per week.
Fundamentals of Object-Oriented Design and Analysis. Designing systems with Unified Modeling Language (UML) and patterns. Applications to other fields.

COMP 566. Geometry and Computer Graphic (3)
Three hours of lecture in the lab per week.
Prerequisite:
Algorithms for geometric analysis and retrieval of 3D shapes from large 3D databases common in several fields, including computer graphics, computer-aided design, molecular biology, paleontology, and medicine. The focus of study will be recent methods for matching, registering, recognizing, classifying, clustering, segmenting, and understanding 3D data.

COMP 569 Artificial Intelligence (3)
Three hours of lecture in the lab per week.
The course covers the many aspects of how human intelligence might be encoded in computer programs and mechanisms such as robots. This includes topics in Natural Language Processing, Computer Vision, Expert Systems, and Automated Problem Solving.

COMP 571. Biologically Inspired Computing (3)
Three hours of lecture in the lab per week.
Study of computing paradigms that have roots in Biology including Neuromorphic Systems, Evolutionary Systems, Genetic Programming, Swarm Intelligence and Artificial Immune Systems.

COMP 572 Neural Networks (3)
Three hours of lecture in the lab per week.
Covers the basic ideas of distributed computation with many simple processing units, similar to the neurons of the brain. Topics include: Hopfield style networks applied to optimization problems, and the backpropagation method applied to pattern classification problems. Additional topics include associate memory, binary vs analog networks, simulated annealing.

COMP 575. Multi-Agent Systems (3)
Three hours of lecture in the lab per week.
Fundamentals of Object-Oriented Design and Analysis. Designing systems with Unified Modeling Language (UML) and patterns. Applications in various situations and fields.

COMP 578 Data Mining (3)
Three hours of lecture in the lab per week.
This graduate course covers the fundamentals of Data Mining. Topics include the analysis of patterns of data in large databases and data warehouses, the application of statistical pattern recognition, and data modeling and knowledge representation. Applications in large databases, gene hunting

COMP/MATH 581. Mathematical Methods in Artificial Intelligence (3)
Three hours of lecture in the lab per week.

Mathematical foundations for Artificial Intelligence: Trees and Search, Predicate Logic, The Theory of Resolution, Nonmonotonic Reasoning, Probability Theory, Bayesian Networks, Fuzziness and Belief Theory, Classifier Systems, Math for Neural Networks, Elements of Statistics, Decision Trees and Optimization.

Math 510 Probabilistic Methods And Measure Theory. (3)
Three hours of lecture in the lab per week.
Introduction to probabilistic methods. Topic include: sigma algebras, measures, integrals, Lebesgue measure, main convergence results and the change of variable results for integrals. Probabilistic methods in computational sciences are studied.

Math 511 Functional Analysis (3)
Three hours of lecture per week.
Metric spaces, function spaces, normed vector spaces, linear operators. Banach spaces, Hilbert spaces. Spectral theory. Fundamental theorems in functional analysis. Applications in various fields including computer science, bioinformatics, statistical analysis.

Math 555 Actuarial Sciences (3)
Three hours of lecture.
The course provides a sound grounding in the mathematical, statistical and financial concepts needed for actuarial work, including technical and communication skills. Probability, statistics, data analysis, mathematical modeling. Risk analysis, pension plans, financial economics, and time series. Various software packages are used.

Math 565 Research in Mathematics Education (3)
Three hours of lecture per week,
Mathematical research methods in education. Current issues of college level curriculum including systems of geometry, algebra, precalculus, calculus, probability and statistics, linear algebra, differential equations, and discrete mathematics.

MATH 482. Number Theory and Cryptography (3)
Three hours of lecture per week.
Number theory, finite fields, polynomial rings, elliptic curves, public-key cryptography, zero-knowlege protocols, primality testing, factorization algorithms and applications.

Math 584 Algebraic Geometry and Coding Theory (3)
Three hours of lecture per week.
Algebraic varieties over algebraically closed fields and finite fields, Hamming codes, cyclic codes, BCH codes, alternant codes, Goppa codes, codes on graphs.

Math 587 Markov Chains and Markov Processes (3)
Three hours of lecture**.**
Topics include: Central Limit Theorem, Law of Large Numbers, Convergence

Theorems, Markov Chains and Markov Processes. Applications in other fields, such as bioinformatics and computer science.

Math 588 Stochastic Analysis (3)
Three hours of lecture**.**
Topics include: Brownian motion, stochastic integrals, conditional expectation, Kolmogorv's Theorem, applications of Lebesgue Dominated Convergence Theorem. Introduction to Stochastic Differential Equations will be given.

Math 597 Master Thesis (1-6)
Supervised research in mathematical sciences or applications. All students are required to present their research at Graduate Seminar and write Master Thesis. Repeatable.

Math 598 Master Project (1-6)
Supervised industrial, educational or scientific project involving use of advanced mathematical methods. All students are required to present their projects at the Graduate Seminar. Repeatable.

Math 599 Graduate Seminar (1)
Oral presentations of current advancements in the field, reports on students' research, master thesis, and projects. Repeatable.

PHYS 510 Advanced Image Analysis Techniques (3)
Three hours of lecture in the lab per week.
Image processing course in the fundamentals of 2-D digital signal processing with emphasis in image processing techniques, image filtering design and applications. Programming exercises in Matlab (or Octave) will be used to implement the various processes, and their performance on synthetic and real images will be studied. Applications in medicine, robotics, consumer electronics and communications.

PHYS 546 Pattern Recognition (3)
Three hours of lecture in the lab per week.
New and emerging applications of pattern recognition - such as data mining, web searching, multimedia data retrieval, face recognition, and cursive handwriting recognition - require robust and efficient pattern recognition techniques. Statistical decision-making and estimation are regarded as fundamental to the study of pattern recognition. The course addresses the issue of analyzing pattern content by feature extraction and classification. The principles and concepts underpinning pattern recognition, and the evolution, utility and limitations of various techniques (including neural networks) will be studied. Programming exercises will be used to implement examples and applications of pattern recognition processes, and their performance on a variety of diverse examples will be studied.

f. List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

Since CSUCI will begin admitting graduate students in Fall 2005, all courses are new and will be needed to initiate the program. MS students in Mathematics are required to complete 15 units of electives from the following list, including 9 units with MATH prefix.

COMP	520	3	Advanced Database Systems
COMP	524	3	Security

COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition

COURSE DESCRIPTIONS FOR CATALOG

See above descriptions

g. If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.

h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.

-Except as noted below, all courses are open to matriculated and graduate students of the University.
-Students seeking admission to the Master of Science in Mathematics Program must be officially accepted into CSUCI graduate MS Mathematics Program.
-Student should provide at least two letters of recommendation.
- Students must remain in good academic standing.

LIST OF COURSES WITH PREREQUISITES – all graduate courses require graduate standing or permission of the instructor:

COMP	510	3	Algorithms (3)
PHYS	510	3	Advanced Image Analysis Techniques (3)
COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence

Math	510	3	Probabilistic Methods And Measure Theory
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition
Math	597	1-6	Master Thesis
Math	598	1-6	Master Project
Math	599	1	Graduate Seminar

i. Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.

- This degree program is a result of cooperation between Mathematics and Computer Science faculty. The program will offer MS degree in Mathematics. All of the courses are shared with MS in Computer Science program.
-The program contains up-to-date technical, theoretical and intellectual achievements in the field of Mathematics.
-It stresses modern computer applications in highly developing fields such as statistical analysis, bioinformatics, artificial intelligence, pattern recognition, computer graphics and mathematics education.
-By requiring graduate projects or thesis (6 units), it implements the distinguishing characteristics of all CSUCI programs: an interdisciplinary and service learning approach to higher education.

j. For undergraduate programs, provisions for articulation of the proposed major with community college programs.

k. Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.

2. Need for the Proposed Degree Major Program

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

Most other CSU campuses offer a Master of Science in Mathematics. However, three nearby private institutions (California Lutheran, Pepperdine, Westmont) do not offer these degrees.

b. Differences between the proposed program and programs listed in Section 2a above.

-The CSUCI Program will provide an opportunity to earn a MS in Mathematics degree to students in the local service area – and offer all students access to a highly desired high-tech and educational positions in a unique program that stresses an interdisciplinary learning approach.
- This degree program is a result of cooperation between Mathematics and Computer Science faculty and stresses modern, scientific approach through mathematical analysis of underlying ideas. All of the courses are shared between the MS in Mathematics and MS in Computer Science programs.

- The program is designed to reflect rapidly changing needs of computational industries and educational needs, and to address the sophisticated applications and computational issues (for example in bioinformatics, data mining, computer graphics, internet development, security issues).

- The program provides local industry related projects and internships with the local high –tech companies.

f. Professional uses of the proposed degree major program.

The Master of Science Mathematics will prepare students for a variety of high-tech industrial positions or advanced mathematics education positions. The Degree would also prepare students for further graduate education in computational fields.

g. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	Number of Majors*	Number of Graduates*
Initiation Year	20	0
Third year	40	20
Fifth year	100	20

•from CSU Channel Islands Enrollments Models

3. Existing Support Resources for the Proposed Degree Major Program

a. Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program.

BRIEF FACULTY BIOGRAPHIES (up to 3 relevant publications listed).

Ivona Grzegorczyk
Professor of Mathematics
PhD in Mathematics, UC Berkeley, 1990
Mathematics Professor since 1990
Extensive experience in the areas of algebraic geometry, moduli problems, applied mathematics, mathematics education.

Selected publications:
1. On Newstead's Conjecture on Vector Bundles on Algebraic Curves, **Mathematichen Annallen 300, 521-541(1994).**
2. Mathematics and Fine Arts, **Kendall/Hunt publishing Co., (2000)** .
3. Geography of Brill-Noether Loci for Small Slopes (with L. Brambila-Paz and P. Newstead), **Journal of Algebraic Geometry. 6 (1997).**

Peter Smith
Professor of Computer Science
PhD in Computer Studies, Lancaster University, 1975
Computer Science Professor since 1980
Extensive experience in the areas of data structures and algorithms

Selected publications:

1. Applied Data Structures with C++ , Jones and Bartlett, 2004
2. Experiments with word-by-word compression of English text using lexicons, **Computer Journal**, 1992.
3. Experiments with a very fast substring search algorithm, **Software-Practice and Experience**, 1991.

William Wolfe
Professor of Computer Science
PhD in Mathematics, CUNY, 1976
Computer Science Professor since 1988
Extensive experience in Neural Networks, Artificial Intelligence, Databases.

Selected publications:

4. Student Peer Reviews in an Upper Division Mathematics Class, **Exchanges**: The Online Journal of Teaching and Learning in the CSU, September
5. Thee Scheduling Algorithms Applied to the Earth Observing Systems Domain **INFORMS Journal on Management Science**, Vol. 46, No. 1, January 2000 pp. 148-
6. A Fuzzy Hopfield-Tank TSP Model **INFORMS Journal on Computing**, Vol. 11, No. 4, Fall 1999 pp. 329-

Andrzej Bieszczad
Visiting Professor of Computer Science
PhD in Computer Engineering, Carleton University, 1996
Visiting Professor since 2003

Selected publications:

1. White T., Pagurek B., and Bieszczad A. (1999), *Network Modeling For Management Applications Using Intelligent Mobile Agents*, **Journal of Network and Systems Management, September, 1999.**
2. Bieszczad, A., White, T., Pagurek, B. (1998), *Mobile Agents for Network Management*, **IEEE Communications Surveys, September, 1998.**
3. Bieszczad, A. and Pagurek, B. (1998), *Neurosolver: Neuromorphic General Problem Solver*, Information Sciences: **An International Journal 105 (1998), pp. 239-277, Elsevier North-Holland, New York, NJ.**

Geoffrey Dougherty
Professor of Physics
Ph.D. in Biophysics, University of Keele, 1979
Medical Imaging/Physics Professor since 1986
Extensive experience in medical imaging, image analysis, and bioengineering.

Selected publications:

3. Dougherty, G and Henebry, G. Lacunarity analysis of spatial pattern in CT images of vertebral bone for assessing osteoporosis. **Med. Eng. Phys., 2002, 24**, 129-138.
4. Dougherty, G. and Kawaf Z. The point spread function revisited: image restoration using 2-D convolution. **Radiography, 2001, 7**, 255-262.

3. Dougherty, G. and Henebry, G. Fractal signature and lacunarity in the measurement of the texture of trabecular bone in clinical CT images. **Med. Eng. Phys., 2001, 23**, 369-380.

Jesse Elliot
Assistant Professor of Mathematics
PhD in Mathematics, UC Berkeley, 2003
Mathematics Professor since 2003
Experience in commutative algebra and number theory.

Selected publications:
3 Witt-Burnside Rings (dissertation), **UC Berkeley, 2003**
4 Binomial Rings (preprint on website)

Jorge Garcia
Assistant Professor of Mathematics
PhD in Mathematics, U-W Madison, 2002
Mathematics Professor since 2002
Extensive experience in Stochastic Processes, Large Deviations, Stochastic Integrals, Probability, Markov Processes and Measure Theory.

Selected publications:
3. An Extension of the Contraction Principle, **Journal of Theoretical Probability,** October, 2003.
4. A Large Deviation Principle for Stochastic Integrals, **Journal of Theoretical Probability,** April, 2004.

- Three additional full-time professors in the Computer Science and Mathematics areas are planned for Fall 2005

- Other CSUCI full-time science faculty will offer interdisciplinary and computation intensive application courses.

This program will require classroom space, computer laboratory space, library materials, library electronic databases and the use of Information Technology (IT) resources.

4. Additional Support Resources Required

b. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.

This program is self-supporting and will be administered through the Extended Education office. Faculty and staff positions will be coordinated and supported by the Extended Education.

d. The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the

space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

The program will use the existing classroom space and new computer labs that are being developed. Since all students are going to be technology literate, some of the courses (or part if the courses) will be offered on-line. This would give the opportunity for local working professionals to participate in the program.

d. Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.

No additional library resources needed above the existing CSUCI Library acquisition program. The faculty is working with the Library staff to assure an appropriate level and subject distribution of library resources.

e. Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

No new needs beyond those planned during the development of the campus facilities.

5. Abstract of the Proposal and Proposed Catalog Description

MASTER OF SCIENCE in MATHEMATICS

- Contact person: Ivona Grzegorczyk, Professor of Mathematics
- Phone: (805) 437-8868 Fax: (805) 437-8864
- Web Page: http://www.csuci.edu
- Email: ivona.grze@csuci.edu

DEGREE OFFERED:
Master of Science in Mathematics

THE PROGRAM: The MS in Mathematics degree at Channel Islands offers latest, cutting edge education for various applied field and mathematics education. The program will prepare students for careers in high-tech, industries, businesses, education systems, military and local and federal government, where interdisciplinary, dynamic and innovative professionals with computational skills are increasingly sought. Students will be given a strong background in mathematics, as well as skills to conduct an independent applied or educational research. The program will stress interdisciplinary applications in other computational sciences, mathematics education and business.

CORE COURSES (11 Units)

Choose 3 courses from the following list:

MATH 510 Probabilistic Methods And Measure Theory (3)
MATH 511 Functional Analysis (3)

COMP 510 Algorithms (3)
COMP 569 Artificial Intelligence (3)
PHYS 510 Advanced Image Analysis Techniques (3)

Required two units:

Math 599 Graduate Seminar (1)

ELECTIVES (15 Units) *

Choose 5 Electives from the following list (at least 3 courses in Mathematics):

COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition

*other graduate or junior/senior courses may be included with advisors approval.

PROJECT OR MASTER THESIS – EMPHASIS (6 units)

Math 597 Master Thesis
Or
Math 598 Master Project

TOTAL CREDITS: 32 units

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005

(LONG FORM)

Proposed Name of Degree: **Master of Science in Computer Science**

Options/ Emphases in the Degree:

Faculty Proposing New Program: Peter Smith, William Wolfe, Geoff Dougherty, Ivona Grzegorczyk, Jorge Garcia, Jesse Elliott

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

a. Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.

California State University Channel Islands
Master of Science in Computer Science
Fall 2005

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Computer Science Program

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Peter Smith, PhD
Professor of Computer Science

William Wolfe, PhD
Professor of Computer Science

Geoff Dougherty
Professor of Physics

Ivona Grzegorczyk, PhD
Professor of Mathematics

Objectives of the proposed degree major program.

General Objectives:
Provide students an opportunity to earn a Masters degree in Computer Science from the California State University.

Prepare students for employment in professional/high-technology industry, including software designer, scientific programmer, and programming analyst, with applications to the sciences, finance, business, education, military and local and federal government.

Prepare students for further study in graduate or professional schools.

Equip students with the analytical and programming skills that apply to variety of fields and offer various career opportunities, including consulting, scientific and technical positions in business and industry, research and development, national and industrial security or teaching positions.

Offer all CSUCI students the opportunity to broaden their knowledge and learn computational skills and computer technology that can be applied to various professional and personal situations.

Learning Objectives:

Students will:

Demonstrate critical thinking, problem solving, and advanced computational skills by identifying, evaluating, analyzing, synthesizing and presenting fundamental and advanced mathematical and computer science issues and their applications.

Demonstrate the knowledge of current computing practices and broad technology use in industry and education, including a working knowledge of software development techniques in various settings.

Be knowledgeable of emerging new technologies and industrial practices connected to the computer industry and demonstrate understanding of computing technologies in society.

Demonstrate cooperation skills by working effectively with others in interdisciplinary group settings – both inside and outside the classroom.

Demonstrate independent working and thinking skills by completing a graduate project and/or master thesis.

Demonstrate a sense of exploration that enables them to pursue rewarding careers in high-tech industries, bio-tech industries, finance, businesses, education systems, military and local and federal government

Demonstrate flexibility, transferability and adaptability of their life-learning skills that are so important n fast changing national and international economy.

Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

32 Semester units required for the major.

Since CSUCI will begin admitting graduate students in Fall 2005, all courses are new and will be needed to initiate the program. These courses will be offered during the first two years (and subsequent years) after program implementation. See the following pages for Courses and Catalog Descriptions.

CORE COURSES (11 Units)

COMP 510 Algorithms (3)
COMP 569 Artificial Intelligence (3)
Choose: One course from:
- MATH 510 Probabilistic Methods And Measure Theory (3)
- MATH 511 Functional Analysis (3)
- PHYS 510 Advanced Image Analysis Techniques (3)

Required: 2 units of:
- COMP 599 Graduate Seminar (1)

ELECTIVES (15 Units)

Choose 5 Electives, at least 3 courses in Computer Science, from the following list:

COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering

COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition

PROJECT OR MASTER THESIS (6 units)

COMP	597	6	Master Thesis

TOTAL CREDITS: 32 units

COURSE DESCRIPTIONS FOR CATALOG

COMP 510 Algorithms (3)
Design strategies for algorithms and data structures. Theoretical limits to space and time requirements. Time/space trade-offs. Categories of problems and algorithms. Applications to business, bioinformatics, engineering, telecommunications and other disciplines. Open problems in the field.

COMP 520 Advanced Database Systems (3)
This graduate course covers advanced analysis of Relational Database Management Systems including their design and implementation. Topics include relational algebras, Entity Relation Diagrams, first, second, and third Normal Forms, data integrity constraints, triggers, query optimization, indexing, stored procedures, distributed databases, database administration issues, transaction processing and scheduling, object oriented database modeling, and data security

COMP 524 Security (3)
A survey of security issues and techniques for stand-alone and networked computer systems including databases. Techniques such as auditing, risk analysis, cost-benefit analysis. Security standards. Application in various fields.

COMP 529. Network Computing (3)
Design and programming of distributed systems that use telecommunication networks as their computing platform.

COMP 532 Computational Bioinformatics (3)
Contemporary computational models used in molecular biology and structures simulations will be introduced. Topics include dynamic programming, statistical/ information techniques for pattern recognition, algorithms for string alignments, structural superposition algorithms, computing with differential information, 3D motifs, Hidden Markov Models, phylogenetic trees, genetic algorithms.

Comp 549 Human-Computer Interaction (3)
The design, development and analysis of effective interfaces to computer systems. Trends in graphical user interfaces.

COMP 550. Object-Oriented Software Engineering (3)
Fundamentals of Object-Oriented Design and Analysis. Designing systems with Unified Modeling Language (UML) and patterns. Applications to other fields.

COMP 566. Geometry and Computer Graphics (3)
Algorithms for geometric analysis and retrieval of 3D shapes from large 3D databases common in several fields, including computer graphics, computer-aided design, molecular biology, paleontology, and medicine. The focus of study will be recent methods for matching, registering, recognizing, classifying, clustering, segmenting, and understanding 3D data.

COMP 569 Artificial Intelligence (3)
The course covers the many aspects of how human intelligence might be encoded in computer programs and mechanisms such as robots. This includes topics in Natural Language Processing, Computer Vision, Expert Systems, and Automated Problem Solving.

COMP 571 Biologically Inspired Computing (3)
Study of computing paradigms that have roots in Biology including Neuromorphic Systems, Evolutionary Systems, Genetic Programming, Swarm Intelligence and Artificial Immune Systems.

COMP 575. Multi-Agent Systems (3)

Fundamentals of modeling and analysis of multi-agent interaction systems, with multiple, competing, goals. Distributed processing concepts will be covered. Object-Oriented Design and Analysis

COMP 578 Data Mining (3)
This graduate course covers the fundamentals of Data Mining. This includes the analysis of patterns of data in large databases and data warehouses, the application of statistical pattern recognition, and data modeling and knowledge representation.

COMP/MATH 581. Mathematical Methods in Artificial Intelligence (3)
This course presents several branches of mathematics that provide computational basis for Artificial Intelligence. The course covers Trees and Search, The Concepts of Predicate Logic, The Theory of Resolution, Nonmonotonic Reasoning, Probability Theory, Bayesian Networks, Fuzziness and Belief Theory, Classifier Systems, Math for Neural Networks, Elements of Statistics, Decision Trees and Optimization.

COMP 572 Neural Networks (3)
Covers the basic ideas of distributed computation with many simple processing units, similar to the neurons of the brain. Topics include: Hopfield style networks applied to optimization problems, and the backpropagation method applied to pattern classification problems. Additional topics include associate memory, binary vs analog networks, simulated annealing.

Comp 597 Master Thesis (1-6)
Supervised research in the field of computer science or its applications. All students are required to present their research at Graduate Seminar and write Master Thesis. Repeatable.

COMP 599 Graduate Seminar (1)
Oral presentations of current advancements in the field, reports on students' research, master thesis, and projects. Repeatable.

Math 510 Probabilistic Methods And Measure Theory. (3)
Three hours of lecture in the lab per week.
Introduction to probabilistic methods. Topic include: sigma algebras, measures, integrals, Lebesgue measure, main convergence results and the change of variable results for integrals. Probabilistic methods in computational sciences are studied.

Math 511 Functional Analysis (3)
Three hours of lecture per week.
Metric spaces, function spaces, normed vector spaces, linear operators. Banach spaces, Hilbert spaces. Spectral theory. Fundamental theorems in functional analysis. Applications in various fields including computer science, bioinformatics, statistical analysis.

Math 555 Actuarial Sciences (3)
Three hours of lecture.
The course provides a sound grounding in the mathematical, statistical and financial concepts needed for actuarial work, including technical and communication skills. Probability, statistics, data analysis, mathematical modeling. Risk analysis, pension plans, financial economics, time series.Various software packages are used.

Math 565 Research in Mathematics Education (3)
Three hours of lecture per week,
Mathematical research methods in education. Current issues of college level curriculum including systems of geometry, algebra, precalculus, calculus, probability and statistics, linear algebra, differential equations, and discrete mathematics.

MATH 482. Number Theory and Cryptography (3)

Three hours of lecture per week.
Number theory, finite fields, polynomial rings, elliptic curves, public-key cryptography, zero-knowledge protocols, primality testing, factorization algorithms and applications.

Math 584 Algebraic Geometry and Coding Theory (3)
Three hours of lecture per week.
Algebraic varieties over algebraically closed fields and finite fields, Hamming codes, cyclic codes, BCH codes, alternant codes, Goppa codes, codes on graphs.

Math 587 Markov Chains and Markov Processes (3)
Three hours of lecture.
Topics include: Central Limit Theorem, Law of Large Numbers, Convergence Theorems, Markov Chains and Markov Processes. Applications in other fields, such as bioinformatics and computer science.

Math 588 Stochastic Analysis (3)
Three hours of lecture.
Topics include: Brownian motion, stochastic integrals, conditional expectation, Kolmogorv's Theorem, applications of Lebesgue Dominated Convergence Theorem. Introduction to Stochastic Differential Equations will be given.

PHYS 510 Advanced Image Analysis Techniques (3)
Three hours of lecture in the lab per week.
Image processing course in the fundamentals of 2-D digital signal processing with emphasis in image processing techniques, image filtering design and applications. Programming exercises in Matlab (or Octave) will be used to implement the various processes, and their performance on synthetic and real images will be studied. Applications in medicine, robotics, consumer electronics and communications.

PHYS 546 Pattern Recognition (3)
Three hours of lecture in the lab per week.
New and emerging applications of pattern recognition - such as data mining, web searching, multimedia data retrieval, face recognition, and cursive handwriting recognition - require robust and efficient pattern recognition techniques. Statistical decision making and estimation are regarded as fundamental to the study of pattern recognition. The course addresses the issue of analyzing pattern content by feature extraction and classification. The principles and concepts underpinning pattern recognition, and the evolution, utility and limitations of various techniques (including neural networks) will be studied. Programming exercises will be used to implement examples and applications of pattern recognition processes, and their performance on a variety of diverse examples will be studied.

f. List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

Since CSUCI will begin admitting graduate students in Fall 2005, all courses are new and will be needed to initiate the program. MS students are required to complete 15 units of electives from the following list.

COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering

COMP	569	3	Artificial Intelligence____
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition

COURSE DESCRIPTIONS FOR CATALOG

See above descriptions

g. If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.

This Masters Program in Computer Science emphasizes close connections between Computer Science and Mathematics. The "emphasis" is on breadth of knowledge in computer science and mathematics, with the aim of preparing students for a wide range of possible industry, academic, and research positions.

h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.

Admission: Students seeking admission are expected to have an undergraduate degree in Computer Science or an undergraduate degree in Mathematics with an emphasis in computer science. Students with undergraduate degrees in closely related areas, such as Engineering and the Sciences, will be considered on a case by case basis and may be provisionally accepted. The applicant is expected to have a 2.7 or higher cumulative undergraduate gpa, and to submit 3 letters of recommendation. Students with cumulative undergraduate gpa less than 3.0 must also submit GRE scores. Students must remain in good academic standing, with at least a B-average in their graduate work.

List of Courses with Prerequisites – This MS CS program is "flat" in that all of the initial courses will not require other graduate course. As a general rule of thumb, a student is expected to have had an undergraduate course in the same area as any graduate course they choose to take, or have permission of the instructor. As this MS CS Program matures advanced courses will be added that require a prerequisite graduate course.

Math	510	3	Probabilistic Methods And Measure Theory
COMP	510	3	Algorithms (3)
PHYS	510	3	Advanced Image Analysis Techniques (3)
COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing
COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing

COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition
COMP	597	1-6	Master Thesis
COMP	599	1	Graduate Seminar

i. Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.

This Masters Program in Computer Science will have a tighter connection with the mathematics program than most equivalent programs in the CSU. This degree program is intended to foster a strong relationship between the computer skills typical of a traditional MS in CS and the analytical skills typical of a higher degree in mathematics. It will also encourage a strong interaction between Mathematics and Computer Science faculty. As a result, there will be a lot of overlap and interaction between graduate mathematics and graduate computer science students.

The program will leverage local industry to provide high tech projects and internships. (We have good relationships with several companies, and our undergraduate students are already placed in internship positions).

j. For undergraduate programs, provisions for articulation of the proposed major with community college programs.

N/A

k. Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.

The program is designed in accordance with the major accrediting body ABET:

Accreditation Board for Engineering and Technology, Inc.
111 Market Pl., Suite 1050
Baltimore, MD 21202
(410) 347-7700
(410) 625-2238 (Fax)

2. Need for the Proposed Degree Major Program

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

Most other CSU campuses offer a Master of Science in Computer Science, as well as most local universities such as CLU, UCSB, and Pepperdine. However, the demand for graduate work in computer science is very high in our region. For example, students working at the Point Mugu and Port Hueneme Military bases have to travel to CSU Northridge or UCSB to get an equivalent

program. It is worth noting that CSUN's computer science program is currently "impacted", so they are not planning to accommodate student demand.

b. Differences between the proposed program and programs listed in Section 2a above.

Our Masters Program in Computer Science will have a tighter connection with the mathematics program than most equivalent programs in the CSU. This degree program is intended to foster a strong relationship between the computer skills typical of a traditional MS in CS and the analytical skills typical of a higher degree in mathematics. It will also encourage a strong interaction between Mathematics and Computer Science faculty. As a result, there will be a lot of overlap and interaction between graduate mathematics and graduate computer science students.

The program will leverage local industry to provide high tech projects and internships. (We have good relationships with several companies, and our undergraduate students are already placed in internship positions).

f. Professional uses of the proposed degree major program.

The Master of Science in Computer Science will prepare students for a variety of high-tech industrial positions. The Degree would also prepare students for further graduate education in computer related fields.

g. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	Number of Majors*	Number of Graduates*
Initiation Year	20	0
Third year	40	30
Fifth year	100	80

* from CSU Channel Islands Enrollments Models

3. Existing Support Resources for the Proposed Degree Major Program

Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program.

BRIEF FACULTY BIOGRAPHIES (up to 3 relevant publications listed).

Ivona Grzegorczyk
Professor of Mathematics
PhD in Mathematics, UC Berkeley, 1990
Mathematics Professor since 1990
Extensive experience in the areas of algebraic geometry, moduli problems, applied mathematics, mathematics education.

Selected publications:
1. On Newstead's Conjecture on Vector Bundles on Algebraic Curves, Mathematichen Annallen 300, 521-541(1994).
Mathematics and Fine Arts, Kendall/Hunt publishing Co., (2000) .
3. Geography of Brill-Noether Loci for Small Slopes (with L. Brambila-Paz and P. Newstead), Journal of Algebraic Geometry. 6 (1997).

Peter Smith
Professor of Computer Science
PhD in Computer Studies, Lancaster University, 1975
Computer Science Professor since 1980
Extensive experience in the areas of data structures and algorithms

Selected publications:
1. Applied Data Structures with C++ , Jones and Bartlett, 2004
2. Experiments with word-by-word compression of English text using lexicons, Computer Journal, 1992.
3. Experiments with a very fast substring search algorithm, Software-Practice and Experience, 1991.

William Wolfe
Professor of Computer Science
PhD in Mathematics, CUNY, 1976
Computer Science Professor since 1988
Extensive experience in Neural Networks, Artificial Intelligence, Databases.

Selected publications:
Student Peer Reviews in an Upper Division Mathematics Class, Exchanges: The Online Journal of Teaching and Learning in the CSU, September
Thee Scheduling Algorithms Applied to the Earth Observing Systems Domain INFORMS Journal on Management Science, Vol. 46, No. 1, January 2000 pp. 148-

A Fuzzy Hopfield-Tank TSP Model INFORMS Journal on Computing, Vol. 11, No. 4, Fall 1999 pp. 329-

Geoffrey Dougherty
Professor of Physics
Ph.D. in Biophysics, University of Keele, 1979
Medical Imaging/Physics Professor since 1986
Extensive experience in medical imaging, image analysis, and bioengineering.

Selected publications:
Dougherty, G and Henebry, G. Lacunarity analysis of spatial pattern in CT images of vertebral bone for assessing osteoporosis. Med. Eng. Phys., 2002, 24, 129-138.
Dougherty, G. and Kawaf Z. The point spread function revisited: image restoration using 2-D convolution. Radiography, 2001, 7, 255-262.
3. Dougherty, G. and Henebry, G. Fractal signature and lacunarity in the measurement of the texture of trabecular bone in clinical CT images. Med. Eng. Phys., 2001, 23, 369-380.

Jesse Elliot
Assistant Professor of Mathematics
PhD in Mathematics, UC Berkeley, 2003
Mathematics Professor since 2003
Experience in commutative algebra and number theory.

Selected publications:
Witt-Burnside Rings (dissertation), UC Berkeley, 2003
Binomial Rings (preprint on website)

Jorge Garcia
Assistant Professor of Mathematics
PhD in Mathematics, U-W Madison, 2002
Mathematics Professor since 2002
Extensive experience in Stochastic Processes, Large Deviations, Stochastic Integrals, Probability, Markov Processes and Measure Theory.

Selected publications:
An Extension of the Contraction Principle, Journal of Theoretical Probability, October, 2003 A Large Deviation Principle for Stochastic Integrals (In Preparation)

4. Additional Support Resources Required

b. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.

This Masters Program in Computer Science will be offered by the Office of Extended Education, so the hiring of additional faculty to support this program, as well as other resources, will be negotiated through that office.

c. The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

As a self-support program, additional labs and classroom space will be paid for and managed by the Office of Extended Education.

d. Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.

If there are any library support services necessary (at the moment there are no plans) they will be paid for by the Office of Extended Education.

e. Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

No new needs beyond those planned during the development of the campus facilities and funded by the Office of Extended Education.

5. Abstract of the Proposal and Proposed Catalog Description

MASTER OF SCIENCE COMPUTER SCIENCE

Contact person: William J. Wolfe, Professor of Computer Science
Phone: (805) 437-8985 Fax: (805) 437-8864
Web Page: http://www.csuci.edu
Email: william.wolfe@csuci.edu

DEGREE OFFERED:
Master of Science in Computer Science

THE PROGRAM: The MS in Computer Science degree at Channel Islands offers latest, cutting edge education in computer science. The program will prepare students for careers as computer professionals in high-tech industries, businesses, education systems, military and local and federal government, where interdisciplinary, dynamic and innovative professionals trained in latest computer technologies are increasingly sought. Students will be obtain a strong background in mathematics, computer hardware and software, as well as skills to conduct independent applied research or develop an industrial project. The program will stress interdisciplinary applications, especially the interaction between Mathematics and Computer Science.

CORE COURSES (11 Units)

COMP 510 Algorithms (3)
COMP 569 Artificial Intelligence (3)
Choose: One course from:
- MATH 510 Probabilistic Methods And Measure Theory (3)
- MATH 511 Functional Analysis (3)
- PHYS 510 Advanced Image Analysis Techniques (3)

Required: 2 units of:
- COMP 599 Graduate Seminar (1)

ELECTIVES (15 Units)

Choose 5 Electives, at least 3 in Computer Science, from the following list,

COMP	520	3	Advanced Database Systems
COMP	524	3	Security
COMP	529	3	Network Computing

COMP	549	3	Human-Computer Interaction
COMP	550	3	Object-Oriented Software Engineering
COMP	569	3	Artificial Intelligence
COMP	571	3	Biologically Inspired Computing
COMP	572	3	Neural Networks
COMP	575	3	Multi-Agent Systems
COMP	578	3	Data Mining
COMP/Math	581	3	Mathematical Methods in Artificial Intelligence
Math	511	3	Functional Analysis
Math	555	3	Actuarial Sciences
Math	565	3	Research in Mathematics Education
Math	582	3	Number Theory and Cryptography
Math	584	3	Algebraic Geometry and Coding Theory
Math	587	3	Markov Chains and Markov Processes
Math	588	3	Stochastic Analysis
PHYS	546	3	Pattern Recognition

PROJECT OR MASTER THESIS (6 units)

COMP	597	6	Master Thesis

TOTAL CREDITS: 32 units

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005
(LONG FORM)

Proposed Name of Degree:	Bachelor of Arts in Biology
Options/ Emphases in the Degree:	General Biology Pre-Professional Studies Subject Matter Preparation in Teaching Biology
Faculty Proposing New Program:	Ching-Hua Wang, Professor and Chair of Biology Amy Denton, Assistant Professor of Biology Nancy Mozingo, Assistant Professor of Biology

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

PROCEDURE FOR SUBMITTING PROPOSALS FOR NEW DEGREE MAJOR PROGRAMS

A campus, in accordance with its approved academic master plan, submits detailed proposals for new degree major programs to the Office of Academic Program Planning for review and approval in the academic year preceding projected implementation. Approval of any degree major program is subject to campus assurances that financial support, qualified faculty, physical facilities and library holdings sufficient to establish and maintain the program will be available within current budgetary support levels. The proposal must follow the format below, and four copies should be sent to Academic Program Planning, Office of the Chancellor.

1. Definition of the Proposed Degree Major Program

a. Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.

Campus- California State University Channel Islands

Degree- Bachelor of Arts in Biology

Implementation- Fall, 2005

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Biology Program, Academic Affairs, CSUCI

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Ching-Hua Wang, Professor and Chair of Biology, CSUCI

d. Objectives of the proposed degree major program.

General Objectives

- Provide students with the opportunity to earn a BA degree in Biology from the California State University Channel Islands.
- Equip students with knowledge and skills in life sciences for such diverse vocations as teaching, the health professions, scientific and environmental organizations, public and private sectors.

Learning Objectives

Students graduating from the Biology program will be able to

- Explain the basic structures and fundamental processes of life at molecular, cellular and organismal levels.
- Identify the evolutionary processes that lead to adaptation and biological diversity.
- Describe the relationship between life forms and their environment and ecosystems.
- Demonstrate an acceptable level of competency in laboratory procedures and techniques.
- Collect, analyze, interpret and present quantitative and qualitative data and incorporate them into the broader context of biological knowledge.
- Apply current technology and scientific methodologies for problem solving in various scientific, professional and community settings.
- Effectively use and critically evaluate current research literature, online information, as well as information related to scientific and biological issues in the mass media.
- Integrate and relate knowledge learned from the classroom with real life situations.

- Communicate in written and oral forms with interested citizens and professionals on biological and scientific issues.

e. Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN BIOLOGY (120 units):

COMMON LOWER DIVISION REQUIREMENTS FOR ALL EMPHASES (8 units):

BIOL 200* Principles of Organismal and Population Biology (4)
BIOL 201 Principles of Cell and Molecular Biology (4)

For Emphasis in General Biology:

UPPER DIVISION REQUIREMENTS IN THE MAJOR (37 units):

1. Required Biology Courses (25 units)

BIOL 300 Cell Biology (4)
BIOL 302 Genetics (4)
BIOL 303 Evolutionary Biology (3)
BIOL 304 Comparative Animal Physiology (3)
BIOL 400 Molecular Biology (4)
BIOL 433* Ecology and the Environment (4)
AND
A minimum of 2 units taken from the following:
BIOL 492 Internship (2-3)
BIOL 494 Independent Research (1-3)
BIOL 497 Directed Study (1-3)
AND
BIOL 499 Senior Capstone Colloquium (1)

2. Electives in Biology (12 units)

Select at least three courses from the following list, one of which must be a lab course.

BIOL 301 Microbiology (4)
BIOL 310 Animal Biology and Ecology (4)
BIOL 311 Plant Biology and Ecology (4)
BIOL 312 Marine Biology (4)
BIOL 313 Conservation Biology (4)
BIOL 316 Invertebrate Zoology (4)
BIOL 317 Parasitology (4)
BIOL 401 Biotechnology and Recombinant DNA Techniques (5)
BIOL 402 Toxicology (3)
BIOL 420 Cellular and Molecular Immunology (4)
BIOL 421 Virology (3)

BIOL 422 Molecular Plant Physiology (4)
BIOL 423 Cellular and Molecular Neurobiology (3)
BIOL 424 Human Physiology (3)
BIOL 425 Human Genetics (3)
BIOL 427 Developmental Biology (4)
BIOL 428 Biology of Cancer (3)
BIOL 431* Bioinformatics (4)
BIOL 432* Principles of Epidemiology and Environmental Health (3)
BIOL 450 Ichthyology: The Biology of Fishes (4)

REQUIRED SUPPORTING AND OTHER GE COURSES (53-54 units):

1. Chemistry (8 units)
CHEM 121* General Chemistry I (4)
CHEM 122 General Chemistry II (4)

2. Mathematics and Statistics (3-4 units)
Select one of the following:
BIOL 202* Biostatistics (3)
MATH 105 Pre-Calculus (4)
MATH 150* Calculus I (4)

3. Other GE Courses in Categories A-E (36)

4. American Institutions Requirements (6)

ELECTIVES IN ANY DISCIPLINE (21-22 units)

<u>For Emphasis in Pre-Professional Studies</u>:

UPPER DIVISION REQUIREMENTS IN THE MAJOR (32 units):

1. Required Biology Courses (21-22 units)
BIOL 300 Cell Biology (4)
BIOL 302 Genetics (4)
BIOL 304 Comparative Animal Physiology (3)
BIOL 400 Molecular Biology (4)
AND
Select one of the following:
BIOL 303 Evolutionary Biology (3)
BIOL 433* Ecology and the Environment (4)
AND
A minimum of 2 units taken from the following:
BIOL 492 Internship (2-3)
BIOL 494 Independent Research (1-3)
BIOL 497 Directed Study (1-3)
AND
BIOL 499 Senior Capstone Colloquium (1)

2. Electives in Biology (10-11 units)
Select at least three courses from the following list, one of which must be a lab course.
BIOL 301 Microbiology (4)
BIOL 310 Animal Biology and Ecology (4)
BIOL 311 Plant Biology and Ecology (4)
BIOL 312 Marine Biology (4)
BIOL 313 Conservation Biology (4)

BIOL 316 Invertebrate Zoology (4)
BIOL 317 Parasitology (4)
BIOL 401 Biotechnology and Recombinant DNA Techniques (5)
BIOL 402 Toxicology (3)
BIOL 420 Cellular and Molecular Immunology (4)
BIOL 421 Virology (3)
BIOL 422 Molecular Plant Physiology (4)
BIOL 423 Cellular and Molecular Neurobiology (3)
BIOL 424 Human Physiology (3)
BIOL 425 Human Genetics (3)
BIOL 427 Developmental Biology (4)
BIOL 428 Biology of Cancer (3)
BIOL 431* Bioinformatics (4)
BIOL 432* Principles of Epidemiology and Environmental Health (3)
BIOL 450 Ichthyology: The Biology of Fishes (4)

REQUIRED SUPPORTING AND OTHER GE COURSES (69-70 units):

1. Chemistry (16 units)

CHEM 121* General Chemistry I (4)
CHEM 122 General Chemistry II (4)
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)

2. Mathematics and Statistics (3-4 units)

Select one of the following:
BIOL 202 Biostatics (3)
MATH 150* Calculus I (4)
(check with professional schools or pre-professional advisor for specific requirements in this category.)

3. Physics (8 units)

PHYS 100 Introduction to Physics I (4)
PHYS 101 Introduction to Physics II (4)

4. Other GE Courses in Categories A-E (36)

5. American Institutions Requirements (6)

ELECTIVES IN ANY DISCIPLINE (10-11 units)

<u>For Emphasis in Subject Matter Preparation in Teaching Biology</u>:

UPPER DIVISION REQUIREMENTS IN THE MAJOR (36 units):

1. Required Biology Courses (24 units)

BIOL 300 Cell Biology (4)
BIOL 302 Genetics (4)
BIOL 303 Evolutionary Biology (3)
BIOL 304 Comparative Animal Physiology (3)
BIOL 335* The Biosphere (3)
BIOL 433* Ecology and the Environment (4)
AND
A minimum of 2 units taken from the following:
BIOL 492 Internship (2-3)
BIOL 494 Independent Research (1-3)

BIOL 497 Directed Study (1-3)

AND

BIOL 499 Senior Capstone Colloquium (1)

2. Electives in Biology (12 units)

Select at least three courses from the following list, one of which must be a lab course.

BIOL 301 Microbiology (4)
BIOL 310 Animal Biology and Ecology (4)
BIOL 311 Plant Biology and Ecology (4)
BIOL 312 Marine Biology (4)
BIOL 313 Conservation Biology (4)
BIOL 316 Invertebrate Zoology (4)
BIOL 317 Parasitology (4)
BIOL 400 Molecular Biology (4)
BIOL 401 Biotechnology and Recombinant DNA Techniques (5)
BIOL 402 Toxicology (3)
BIOL 420 Cellular and Molecular Immunology (4)
BIOL 421 Virology (3)
BIOL 422 Molecular Plant Physiology (4)
BIOL 423 Cellular and Molecular Neurobiology (3)
BIOL 424 Human Physiology (3)
BIOL 425 Human Genetics (3)
BIOL 427 Developmental Biology (4)
BIOL 428 Biology of Cancer (3)
BIOL 431* Bioinformatics (4)
BIOL 432* Principles of Epidemiology and Environmental Health (3)
BIOL 450 Ichthyology: The Biology of Fishes (4)

REQUIRED SUPPORTING AND OTHER GE COURSES (76 units):

1. Required Education Course (3 units)

EDUC 330 Introduction To Secondary Schooling (3)

2. Mathematics and Statistics (7 units)

BIOL 202 Biostatistics (3)

AND

MATH 105 Pre-Calculus (4)

Or

MATH 150* Calculus I (4)

3. Physical Sciences (24 units)

CHEM 121* General Chemistry I (4)
CHEM 122 General Chemistry II (4)
GEOL 121 Physical Geology (4)
PHYS 100 Introduction to Physics I (4)
PHYS 101 Introduction to Physics II (4)
PHYS 105 Introduction to the Solar System (4)

4. Other GE Courses in Categories A-E (36)

5. American Institutions Requirements (6)

(Courses with * are double-counted toward GE credits.)

Summary of Program Requirements for Each of the Emphases

Program	Units in the Major	Units in Free Electives	Units in Supporting/GE Courses	Total
General Biology	45	21-22	53-54	120
Pre-Professional	40	10-11	69-70	120
Pre-Teaching Credential	44		76	120

(1) All lower-division courses are needed for in-coming freshmen beginning in 2005.
(2) All upper-division required courses and selective elective courses are needed for transfer students.

COURSE DESCRIPTIONS:
(All courses have been approved for the BS in Biology program.)

BIOL 100 EXPLORING THE LIVING WORLD (4)
Three hours lecture and three hours laboratory per week
An overview of biology from the molecular to the ecosystem level. Topics include the origin, diversity and evolution of life, ecology of populations and communities, the structure and function of plant and animal organ systems, biological molecules, cellular structure/function, genetics and cell division. No credit given toward the major in biology. A lab fee is required.
GenEd: B2

BIOL 170 FOUNDATIONS OF LIFE SCIENCE (4)
Three hours lecture and three hours laboratory per week
This course meets the needs of prospective elementary school teachers. The course will cover a broad spectrum of topics including introduction to scientific inquiry with living organisms, physiology, cell biology, genetics, evolution and ecology. Current issues in biology will also be considered. The laboratories will focus on hands-on activities particularly relevant to elementary school students. No credit given toward the major in Biology. A lab fee is required.
GenEd: B2

BIOL 200 PRINCIPLES OF ORGANISMAL AND POPULATION BIOLOGY (4)
Three hours lecture and three hours laboratory per week
An introduction to organismal biology including the diversity, comparative structure, organ system function, development, phylogeny, taxonomy and systematics of prokaryotes, protists, fungi, plants and animals. Discussion of the principles of evolution including speciation and natural selection, the environmental impact and ecosystem interaction of plants and animals, the behavior of animals, population genetics and population biology. A lab fee is required.
GenEd: B2

BIOL 201 PRINCIPLES OF CELL AND MOLECULAR BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 105 or CHEM 121
This course will cover principles of basic chemistry, biological macromolecules, prokaryotic and eucaryotic cell structure and function, homeostasis, metabolism including both respiration and photosynthesis, cell division, signal transduction, Mendelian genetics, molecular genetics including transcription and translation, and a brief introduction to virology and immunology. The philosophy of science, scientific method and experimental design are foundational to the course. A lab fee is required.

GenEd: B2

BIOL 202 BIOSTATISTICS (3)
Three hours lecture/laboratory per week
Prerequisite: A passing score on the Entry Level Mathematics Exam (ELM) or MATH 105 or equivalent
Critical reasoning using a quantitative and statistical problem-solving approach to solve real-world problems. Uses probability and statistics to describe and analyze biological data collected from laboratory or field experiments. Course will cover descriptions of sample data, probability and empirical data distributions, sampling techniques, estimation and hypothesis testing, ANOVA, and correlation and regression analysis. Students will use standard statistical software to analyze real world and simulated data. Same as MATH 202 and PSY 202
GenEd: B3

BIOL 210 HUMAN ANATOMY AND PHYSIOLOGY I (4)
Three hours lecture and three hours laboratory per week.
Study of gross and microscopic anatomy and physiology of the human body. Topics include homeostasis, cell structure/function, histology, the skeletal system, the muscular system, the digestive system and the nervous and sensory systems. A lab fee is required.

BIOL 211 HUMAN ANATOMY AND PHYSIOLOGY II (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 210
Study of gross and microscopic anatomy and physiology of the human body. Topics include the integumentary system, the endocrine system, the circulatory system, the immune system, the respiratory system, the urinary system and the reproductive system. A lab fee is required.

BIOL 212 NEUROBIOLOGY AND COGNITIVE SCIENCE (3)
Three hours lecture per week
Prerequisite: BIOL 100 or BIOL 200 or BIOL 201
Principles of brain organization and function underlying behavior. Topics include neuroanatomy and physiology of language, vision, sexual behavior, memory and abnormal behavior. Same as PSY 212
GenEd: B2, E

BIOL 213 SEX, GERMS AND DISEASES (3)
Three hours lecture/discussion per week
This is a course to introduce biology of sexually transmitted diseases and their impact on society. It covers reproductive system, factors in the spread of diseases, biology and pathogenesis of infectious agents and sexually transmitted diseases caused by bacteria, viruses, fungi and protozoa. Topics also include impact of current biotechnology in relation to vaccine development, treatment and improved diagnostics of these diseases as well as challenges of these diseases to economy, public health system, individuals, and society at large.
GenEd: B2, E

BIOL 214 FROM EGG TO ORGANISM (3)
Three hours lecture per week
How does a single cell give rise to a complex organism? How are stem cells produced and what are possible uses of stem cell lines? How are clones produced and what are the ethical considerations for cloning human beings? How are test tube babies produced? This course will explore answers to these questions by presenting an overview of developmental biology and then focusing on the impact of biotechnology on humankind. No credit given toward the major in biology.
GenEd: B2

BIOL 215 ANIMAL DIVERSITY (4)

Three hours lecture and three hours laboratory per week
This course will survey the animal kingdom emphasizing the continuity of animal life from simple to more complex body forms and life histories. The diversity of animal life is projected on a framework of basic ecological and evolutionary concepts. Human interactions with animals are explored through management and conservation issues as well as historical examples from the sciences of zoology, classification and evolution. Field trips to selected sites will allow direct examination of local animal diversity. A lab fee is required.
GenEd: B2

BIOL 300 CELL BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 201 with a grade of C or better, CHEM 122
Detailed study of the organization and functioning of cells and cellular organelles at the cellular and molecular levels, emphasizing experimental approaches and structural and functional relationships and their regulation and control. Topics include macromolecules, membrane phenomena, metabolism, enzyme kinetics, and cellular events associated with excitable cells and tissues. A lab fee is required.

BIOL 301 MICROBIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 201 with a grade of C or better and CHEM 122
Study of microorganisms of the environment, including disease-causing organisms, their structures and functions and their interactions to their host animals and the environment. A lab fee is required.

BIOL 302 GENETICS (4)
Three hours lecture and one hour recitation per week
Prerequisite: BIOL 201 with a grade of C or better and CHEM 122
Principles of classical transmission genetics, population genetics, with an introduction to modern molecular genetics.

BIOL 303 EVOLUTIONARY BIOLOGY (3)
Three hours lecture per week
Prerequisite: BIOL 200 and 201
This course will examine principles of biological evolution. Topics include evolutionary genetics, adaptation and natural selection, the fossil record, speciation and macroevolution.

BIOL 304 COMPARATIVE ANIMAL PHYSIOLOGY (3)
Three hours lecture per week
This course will use a comparative approach to examine physiological principles in a variety of vertebrate and invertebrate animals. Topics include homeostasis, respiration, excretion and physiological adaptations to environmental conditions.

BIOL 310 ANIMAL BIOLOGY AND ECOLOGY (4)
Three hours lecture and three hours laboratory per week
Animal adaptation and diversity and their relationship to the development of evolutionary theory and the environment. Identification of the common invertebrates and vertebrate animals. Field trips to local ecosystems will be taken. A lab fee is required.

BIOL 311 PLANT BIOLOGY AND ECOLOGY (4)
Three hours lecture and three hours laboratory per week
A general introduction to diverse structures and functions of plants and their relationship to the environment. Identification of local native plants and plant communities, uses of native plants by Native Americans, and human and environmental impacts on native plant communities. Field trips to local sites will be taken. A lab fee is required.

BIOL 312 MARINE BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
Overview of the complexity of marine life including marine plants and animals and the processes that underlie their distribution and abundance in open oceans, coastal regions, estuaries and wetlands. Topics included diverse interactions of organisms in the intertidal zone, over the continental shelves and in the open oceans. Field trips to local marine environments will be taken. A lab fee is required.

BIOL 313 CONSERVATION BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
This course explores issues surrounding the conservation of biodiversity. Topics to be covered include: species-, population-, and ecosystem-level issues, biodiversity, extinction, sustained yield, exotic species, and reserve design. Management implications and the ecology of issues are integrated throughout the course. Lab fee required. Same as ESRM 313

BIOL 315 INTRODUCTION TO BIOPHYSICS (3)
Three hours lecture and two hours activity per week
Prerequisite: PHYS 200
Co-requisite: BIOL 300
This course applies physical methods to the study of biological systems, including transport processes and membrane phenomena, bioelectric phenomena, photosynthetic systems and visual systems. Biophysical methods will include the techniques of patch clamping and optical tweezers, and the measurement of action potentials and evoked responses.
There will be an emphasis on modeling and on problem solving, with appropriate mathematics when necessary. The practical activity session will include computer modeling and simulation, and laboratory demonstrations and exercises. Same as PHYS 315

BIOL 316 INVERTEBRATE ZOOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
This course will survey invertebrates from simple, single-celled protists to the most complex of invertebrate animals. Over ninety-five percent of the animals on earth are invertebrates -- animals without backbones. Aspects of the ecology, physiology and evolutionary history of this diverse array of animals will be examined. Human interactions with invertebrates and conservation issues will also be highlighted. Field trips will be required. A lab fee is required.

BIOL 317 PARASITOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
This course surveys the diversity of parastic animals and protists. The parasitic life mode is found in a broad range of animal and protistan phyla, as well as some plant groups. Parasite-host relationships are often tightly co-evolved. Parasites have remarkable and complex adaptations to allow survival and successful reproduction and dispersal. Topics examined will include evolution and life histories of representative parasites, along with medical and epidemiological factors of those that affect humans or domestic animals. A lab fee is required.

BIOL 326 SCIENTIFIC AND PROFESSIONAL ETHICS (3)
Three hours lecture per week
Discussion of ethical issues and societal challenges derived from scientific research and professional activities. Examines the sources, fundamental principles, and applications of ethical behavior; the relationship between personal ethics and social responsibility of organizations; and the stakeholder management concept. Applies ethical principles to different types of organizations: business, non-profits, government, health care, science/technology, and other professional groups. Topics also include integrity of scientific research and literature and

responsibilities of scientists to society, intellectual property, ethical practices in professional fields, ethical dilemmas in using animal or human subjects in experimentation, gene cloning, animal cloning, gene manipulation, genetic engineering, genetic counseling, and ethical issues of applying biotechnology in agricultural fields. Emphasizes cases to explore ethical issues. Same as CHEM 326 and MGT 326
GenEd: D

BIOL 331 BIOTECHNOLOGY IN THE TWENTY-FIRST CENTURY (3)
Three hours lecture per week
Presentation of recent advances in biotechnology and discussion of societal implications. Topics include the processes and methods used to manipulate living organisms, or the substances and products from them, for use in medicine, agriculture, food production, gene therapy, forensics and warfare. The social, ethical and political issues raised by modern biotechnology will be discussed. No credit given toward the biology major.
GenEd: B2, D and Interdisciplinary

BIOL 332 CANCER AND SOCIETY (3)
Three hours lecture per week
The underlying molecular causes of cancer, the impact of environmental and genetic factors on cancer causation and prevention, recent advances in diagnosis and treatment of the disease, and the impact that this disease, which will affect one in three adults, has on society. No credit given toward the biology major.
GenEd: B2, D, and Interdisciplinary

BIOL 333 EMERGING PUBLIC HEALTH ISSUES (3)
Three hours lecture per week
Discussion of emerging infectious diseases and other health related issues with global concerns such as AIDS, tuberculosis, sexually transmitted diseases, cardiovascular diseases, animal and bird diseases which may be transmitted to people, food and blood safety issues, environmental public health hazards, immigration and public health issues, potential biological weapons and their impact on human and animal populations in the world and the ecosystem.
GenEd: B2, E and Interdisciplinary

BIOL 334 NATURAL HISTORY OF VENTURA COUNTY (3)
Three hours lecture and three hours laboratory per week
This course will explore the biota and ecosystems of Ventura County. Local ecosystems include chaparral, marine, stream, desert, mountain and island. Topics covered will be classification and diversity of conspicuous regional flora and fauna in the field and laboratory, basic ecological and evolutionary principles of botanical and zoological classification, ecosystem diversity and function. Indigenous cultural and colonial era use of biotic resources, history of scientific exploration of the region, conservation and preservation issues, restoration of natural habitats, adaptation, life history and physiology of resident organisms will also be covered. Field trips will be required.
GenEd: B2 and Interdisciplinary

BIOL 342 THE ZOO: CONSERVATION, EDUCATION AND RECREATION (3)
Three hours lecture per week
An interdisciplinary study of zoos and zoological gardens from scientific, managerial, business, recreational and educational perspectives. Analyzes how these perspectives are linked within zoo practices. The course will include an in-depth case study of a local zoo. Field trips to local zoos will be required. Same as BUS 342, ECON 342 and EDUC 342
GenEd: D and Interdisciplinary

BIOL 400 MOLECULAR BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 300 or 302 with a grade of C or better

Study of informational macromolecules and how they direct molecular processes in both eukaryotic and prokaryotic cells. Topics include structure, function and regulation of the genetic material at the molecular level, gene organization, structures and functions of DNA, RNA and proteins, gene transcription and expression, RNA processing, genomics and proteomics. A lab fee is required

BIOL 401 BIOTECHNOLOGY AND RECOMBINANT DNA TECHNIQUES (5)
Three hours lecture and six hours laboratory per week
Prerequisite: BIOL 300 and 302 with grades of C or better and CHEM 318 or 400
Theory and practice of various biotechnologies and recombinant DNA techniques applicable to research and development, drug discovery, clinical therapies, preventive medicine, agriculture, the criminal justice system and a variety of other fields. Modern techniques in genomics and proteomics will be introduced in the laboratories. A lab fee is required.

BIOL 402 TOXICOLOGY (3)
Three hours lecture per week
Prerequisite: BIOL 201 with a grade of C or better and CHEM 122
An in depth study of toxic chemicals and their interactions within the ecosystems. Topics include the origin, fate, chemical and biological detection, and quantification of pollutants and toxins and their impact on organisms at the molecular, biochemical, cellular, physiological, organismal, and community levels of organization. Basic toxicology, genetic toxicology, environmental mutagenesis and the molecular basis of mutation induction will be covered.

BIOL 416 RADIOBIOLOGY AND RADIONUCLIDES (3)
Three hours lecture per week
Prerequisite: BIOL 300 and PHYS 201
Topics include: nature and effects of ionizing radiation on biomolecular structures and living cells; applied radiobiology and radionuclides; genetic effects of ionizing radiation and methods of protection and dosimetry. Same as PHYS 416

BIOL 420 CELLULAR AND MOLECULAR IMMUNOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 300 with a grade of C or better and CHEM 122
Study of cellular and molecular aspects of the immune system and its responses against infectious agents and/or environmental insults. Included are development of the organs and cells of the immune system, genetics of the molecules of the immune system and their functions and interactions during an immune response, immunological disorders such as immunodeficiencies, autoimmune diseases, transplantation, and contemporary immunological techniques used in clinical diagnosis and other modern research and development applications. A lab fee is required

BIOL 421 VIROLOGY (3)
Three hours lecture per week
Prerequisite: BIOL 301 with a grade of C or better and CHEM 122
Study of aspects of molecular structure, genetics, and replication of viruses and other sub-viral agents such as prions and viroids, virus-host interactions, pathogenesis of viral infections, diagnostic virology, and antiviral vaccines and drugs; emphasis on human pathogens.

BIOL 422 MOLECULAR PLANT PHYSIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 300 with a grade of C or better and CHEM 318 or 400
Study of principles and methods of plant physiology at the molecular level combined with modern plant technology. Topics include plant tissue and cell culture, genetic engineering and transformation, plant defense, genomics and applications of DNA technology. A lab fee is required.

BIOL 423 CELLULAR AND MOLECULAR NEUROBIOLOGY (3)

Three hours lecture per week
Prerequisite: BIOL 300 with a grade of C or better and CHEM 122
Study of the nervous system at cellular and molecular levels including cellular structure of neurons and their function and interactions, neurotransmitters and their function and regulation, chemical agents and their effects on neuronal cells and normal responses by the cells and the molecules of the nervous system and their responses under adverse conditions.

BIOL 424 HUMAN PHYSIOLOGY (3)
Three hours lecture per week
Prerequisite: BIOL 300 with a grade of C better and CHEM 122
Study of human physiology at both the cellular and organ system levels including neurophysiology, muscle physiology, cardiovascular physiology, respiration, kidney function, hormone function and reproduction.

BIOL 425 HUMAN GENETICS (3)
Three hours lecture per week
Prerequisite: BIOL 300 and 302 with grades of C or better and CHEM 122
Basic principles of human inheritance, including the transmission of genetic traits, chromosomal abnormalities and their effects, gene structure and function, pedigree analysis, gene mapping, cytogenetics, mutations and mutagenic agents, cancer genetics, molecular analysis of inherited diseases and genetically controlled phenomena in humans.

BIOL 427 DEVELOPMENTAL BIOLOGY (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 300 with a grade of C or better and CHEM 122
This course will use descriptive, experimental and comparative approaches in the study of animal development. Developmental stages including gametogenesis, fertilization, cleavage, gastrulation and organogenesis will be discussed in a variety of animal phyla. The molecular and cellular mechanisms underlying morphogenesis and the evolutionary conservation of developmental mechanisms in various animal phyla will be examined. A lab fee is required.

BIOL 428 BIOLOGY OF CANCER (3)
Three hours lecture per week
Prerequisite: BIOL 300 with a grade of C or better and CHEM 122
Principles of oncology are examined. Included are mechanisms of oncogenesis at cellular and molecular levels, characteristics of cancer, advantages and disadvantages of various therapies of cancer treatment.

BIOL 431 BIOINFORMATICS (4)
Four hours lecture in the lab per week
Prerequisite: BIOL 400 with a grade of C or better and CHEM 318 or 400
The rapid expansion of data acquisition for the human genome and proteome has huge implications for our understanding of the most fundamental processes that direct human life. An understanding of the methodologies used to acquire, store and analyze these data bases is of great value for students choosing to pursue careers in molecular biology, genetics and biotechnology. Topics include: regulating the genome, including epigenetic mechanisms, the human genome project, including the clinical genetics databases, bioinformatics tools and databases, identifying functional and structural sequence elements, analysis of gene expression: microarrays and other tools. A lab fee is required.
GenEd: B2, B4, and Interdisciplinary

BIOL 432 PRINCIPLES OF EPIDEMIOLOGY AND ENVIRONMENTAL HEALTH (3)
Three hours lecture per week
Prerequisite: BIOL 201 with a grade of C or better and CHEM 122
Distribution and dynamics of human health problems and principles and procedures used to determine circumstances under which disease occurs or health prevails and to aid in managing

and planning health and environmental systems. The broadened scope of epidemiology is examined through case studies and community and environmental health approach.
GenEd: B2, D and Interdisciplinary

BIOL 433 ECOLOGY AND THE ENVIRONMENT (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
Ecological characteristics of natural ecosystems and basic effects of human society upon those systems. Plant and animal distribution patterns in relation to past and present physical and biotic factors. Issues of resource management, population, food production, global environmental problems will also be emphasized to explore future directions. Field trips to local ecosystems will be taken. A lab fee is required.
GenEd: B1, B2 and Interdisciplinary

BIOL 434 INTRODUCTION TO BIOMEDICAL IMAGING (3)
Three hours lecture and two hours lab activity per week
Prerequisite: BIOL 210 or PHYS 200
The course will present an overview of biomedical images and imaging systems. The fundamental concepts used in several imaging modalities (such as projection radiography, mammography, DEXA, computed tomography, ultrasonography and magnetic resonance imaging) will be examined: the emphasis will be on an intuitive and descriptive presentation of the main components of these systems. Image formation and reconstruction will be addressed. The resulting clinical images will be correlated with the underlying structure and function of the organs, and the diagnostic utility and limitations of the images will be considered. Same as HLTH 434 and PHYS 434
GenEd: B2, E and Interdisciplinary

BIOL 450 ICHTHYOLOGY: THE BIOLOGY OF FISHES (4)
Three hours lecture and three hours laboratory per week
Prerequisite: BIOL 200
This course will survey the diversity of living and fossil fishes. Fishes are the largest and most diverse group of vertebrate animals. Aspects of the ecology, physiology and evolutionary history of these animals will be examined. Extensive human interactions with fishes and particularly conservation issues will be highlighted. Emphasis will be placed on the identification and biology of California coastal and inland species. Field trips will be required. A lab fee is required.

BIOL 464 MEDICAL INSTRUMENTATION (4)
Three hours lecture and two hours lab activity per week
Prerequisite: PHYS/BIOL/HLTH 434
The detection, acquisition, processing and display of diagnostic clinical images. The course will concentrate on the fundamentals of the design of the instruments and the use of appropriate reconstruction algorithms in (computed) radiography, (digital) fluoroscopy, computed tomography, ultrasound, magnetic resonance imaging and radionuclide imaging. Activities will include image reconstruction examples, investigation of recent innovations, and two trips to local Radiology departments. Same as PHYS 464

BIOL 490 SPECIAL TOPICS (3)
Three hours seminar per week
Prerequisite: Consent of instructor
In-depth analysis of current topics in biology. Topics vary each semester. Repeatable by topic.

BIOL 491 SPECIAL LABORATORY TOPICS (1-3)
Prerequisite: BIOL 300 with a grade of C or better and CHEM 122
Laboratory study of a selected topic, the title of which is to be specified in advance. Repeatable by topic. A lab fee is required.

BIOL 492 INTERNSHIP (2-3)
Prerequisite: Consent of instructor and program approval
Supervised work and study in work situations involving biological research and technical skills. May involve service learning. All students are required to attend the Biology Program Senior Capstone Colloquium to present their projects. Graded Credit/No Credit

BIOL 494 INDEPENDENT RESEARCH (1-3)
Prerequisite: Consent of instructor and program approval
Laboratory and/or library research that may involve service learning in selected areas of biology conducted under the direction of a faculty member. All students are required to attend the Biology Program Senior Capstone Colloquium to present their projects. Graded Credit/No Credit

BIOL 497 DIRECTED STUDY (1-3)
Consent of instructor and program approval
Reading and library research that may involve service learning in selected areas of biology conducted under the direction of a faculty member. All students are required to attend the Biology Program Senior Capstone Colloquium to present their projects. Graded Credit/No Credit

BIOL 499 SENIOR CAPSTONE COLLOQUIUM (1)
One hour lecture per week
Prerequisite: BIOL 492, 494 or 497
Oral and written presentation of completed or work-in-progress projects of BIOL 492, 494, or 497 courses. Graded Credit/No Credit

f. List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.

Identify new courses to initiate the program:
None.
Courses needed for the first two years:
All required lower- and upper-division and selective upper-division elective courses are needed in the first two years of implementation of the program so that students can graduate after two years. All courses have been implemented for the BS degree in Biology.

(Note: With regard to Sections 1e and 1f, a proposed program should take advantage of courses already offered in other departments when subject matter would otherwise overlap or duplicate existing course content.)

g. If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.

We plan to offer a BA degree in Biology with Emphases in General Biology, Pre-Professional Studies and in Subject Matter Preparation in Teaching Biology. See the above requirements. Students in all emphases are required to take 8 units of lower-division core biology courses. The students enrolled in the General Biology Emphasis will be required to take 37 units of upper-division biology courses in the major. The balance of the 120 units would include free electives, required supporting courses and other GE courses. The students enrolled in the Pre-Professional Studies Emphasis will be required to take 32 units of upper-division biology courses in the major

with remaining units in free electives, required supporting courses and other GE courses. The students in Subject Matter Preparation in Teaching Biology Emphasis will be required to take 36 units of upper-division courses in the major, with the remaining units in specified subject matter preparation courses, other required supporting courses and GE courses.

h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.

- There is no additional course prerequisite or other criterion from the biology program beyond the standard admission criteria of the university.
- Students seeking admission to the Biology BA degree program must be officially accepted into the CSUCI academic program.
- Students must declare themselves as BA in Biology majors.
- Students must remain in good academic standing throughout the duration of their enrollment in CSUCI.
- Students must complete and fulfill the requirements of the BA degree program within a designated period specified by the university.

i. Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.

The special characteristics of this program are:

- It takes 120 units to complete, which ensures that full-time students can complete the program in 4 years.

- The program allows students to prepare for a wide range of career pathways after graduation so that they could go to graduate schools, professional schools, single subject teaching credential programs or go into careers in public and private sectors.

- One unique emphasis in the major is the Subject Matter Preparation in Teaching Biology. We designed this emphasis by using the most up-to-date content standards from the California Commission on Teaching Credentials. A set of disciplinary and interdisciplinary courses have been proposed and approved last year to support this program. Once again, if students graduating from the BA program do not get into the teaching program, they can still use their BA in biology degree to launch a career path aside from teaching biology in secondary education.

- Aside from the conventional General Biology emphasis, we propose a Pre-Professional Studies emphasis for the major. Like the Subject Matter Preparation in Teaching Biology program, students enrolled in this program, if not admitted into a professional school, could still obtain a solid education in biology with the BA degree and could attain numerous career options after graduation.

- The program contains lower-division core courses, upper-division required and elective courses, service learning component in the form of internship, independent research or directed studies, and capstone courses, which will be useful vehicles to carry out community service activities, and formative and summative outcomes assessment for program improvement and quality assurance.

- On top of the 48 units in the General Education courses and the American Institutions requirements, the General Biology program further provides up to 22 units of free electives to allow students to expand the breadth and depth of their education in the areas of their interests. By combining the supporting courses required of their major, General Education courses and the free elective units, they could easily obtain a major in Biology and a minor in another field.

- All courses to be used to support the BA program are already in place for our approved BS program in Biology.

j. For undergraduate programs, provisions for articulation of the proposed major with community college programs.

- For most of the lower-division courses, we have made articulation agreements with all the community colleges in the region.

- We have also articulated chemistry, physics and mathematics courses with the community colleges.

k. Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.

N/A

2. Need for the Proposed Degree Major Program

The primary distinction between a BA and a BS is that of breadth of experience vs. depth of focus. The traditional Bachelor of Arts degree provides a more broadly based experience in the "liberal arts and sciences" -- a college experience that goes beyond the minimum requirements in Arts and Humanities, as a strong complement to exposure to math and science. The Bachelor of Science degree offers a slightly different label for a degree that is more focused in the sciences and mathematics, with less breadth of experience in other areas.

Our Bachelor of Arts degree is designed for students seeking a broad foundation in biology as part of a liberal education in the arts and sciences. The BA program provides opportunities for students to explore non-science disciplines and interdisciplinary courses to broaden their scope of education. Provided that careful attention is paid to the requirements for advanced (post-baccalaureate) and professional programs, the B.A. degree is appropriate for those students (1) intending to enter the workforce in settings such as field work, pharmaceutical sales, or a variety of career options, (2) seeking a teaching credential, or (3) preparing for professional schools in dentistry, medicine, optometry, pharmacy or veterinary medicine.

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

- There are several CSU campuses across the state that offer a BA in Biology program, including CSUS, CSUSB, SFSU, SJSU, CSUSM, CSU Sonoma, CSU Stanislaus, CSUN, CSUH. Among the neighboring 4-year comprehensive universities, CSUSB, CSUSM and CSUN, UCSB and UCSC, Pepperdine University and California Lutheran University provide students with a BA degree program in Biology.

b. Differences between the proposed program and programs listed in Section 2a above.

- CSUCI is the only four-year public university in Ventura County that will offer a Bachelors of Art Degree in Biology.

- None of the above universities offers students a BA in Biology with an Emphasis in Subject Matter Preparation in Teaching Biology. Some of the programs do offer courses to pre-credential students. However, they are not incorporated as an emphasis in the BA program. We also provide a pre-professional track in additional to the general biology track. All

emphases require students to complete a set of essential biology courses and other supporting math and science courses. Hence, students can obtain a quality baccalaureate education in the life science area that they could always rely and build on even if they do not get into professional schools or teaching credential programs.

- Despite the rigor of the curriculum, our general biology program provides up to 22 units of free electives for students to take courses in their particular interests. This allows further expansion of their breadth and depth in areas beyond the required General Education category of courses. Students could easily complete a major in biology and a minor in a secondary field. If they desire, they could obtain a double major in biology and chemistry without too many additional units.

- It provides a solid one-year core biology courses as the lower-division requirements. The two core courses cover organismal, population, cell and molecular biology, which will introduce students in the major with a comprehensive background in biology. This set of courses will allow assessment activities to evaluate the students and the program as a whole during the initial phase of the four-year program.

- It also contains the most up-to-date essential fields in biology such as Cell Biology, Genetics and Evolution, Ecology, and Molecular Biology as required upper-division courses, which will provide students with a solid, rigorous and comprehensive education in biology. Cell Biology provides the fundamentals of the cell, which is the building block of *all* living organisms. This course is required of all students, including transfer students and is used as a prerequisite course for most of the upper-division biology courses. The course therefore provides a mid-program outcomes assessment venue.

- The lower- and upper-core two-tier organization will allow us to carry out learning community activities as well as outcomes assessment. The service-learning and capstone courses will be highly useful for summative assessment.

f. Professional uses of the proposed degree major program.

- Students in the major will develop analytical skills and expertise in life sciences, which will allow them to further study or work in such diverse areas as field studies, scientific research, science education, consulting, environmental agencies, governmental agencies, biomedical fields, clinics and laboratories, public health organizations, and the various allied health professions.

- Students can use this degree to apply for and gain acceptance into graduate programs at universities as well as professional schools such as medical, dental, pharmacy, optometry, veterinary, and other medically related professional schools.

- Students can also apply for single subject credential programs to become a secondary education teacher in biology.

g. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

The rough estimates for the first year, third year and fifth year enrollment are as follows:
Year 1: 30-40; Year 3: 60-80; Year 5: 100-120.

The expected number of graduates in:
Year 1: 5-10, depending on how many juniors will be admitted the first year;
Year 3: 20-30; Year 5: 60-70

3. Existing Support Resources for the Proposed Degree Major Program

a. Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program.

Ching-Hua Wang
Professor and Chair of Biology
PhD in Immunology, 1986, Cornell University
MD, 1978, Beijing University Medical Center (Former Beijing Medical University)
CSU professor since 1990
Extensive experience in the areas of immunology, virology, infectious diseases, and microbiology.

Amy Denton
Assistant Professor of Biology
PhD in Botany, 1997, University of Washington
Taught biology courses at University of Alaska from 2000-2003
Extensive experience in the field of molecular biology, plant biotechnology, bioinformatics, molecular evolution, plant biology, comparative genomics, plant molecular systematics, population genetics, biogeography and historical demography.

Nancy Mozingo
Assistant Professor of Biology
PhD in Zoology, 1993, Arizona State University
Taught biology courses at graduate and undergraduate levels at Miami University (Oxford, Ohio) from 1998-2002 before joining the CSUCI faculty.
Extensive experience in the field of developmental/cell biology.

Other CSUCI full-time faculty listed below are also involved in teaching some of the relevant pre- and requisite courses:

Simone Aloisio
Assistant Professor of Chemistry
Ph.D in Chemistry, 2000, Purdue University
Chemistry Professor since 2003
Extensive experience in research and education in chemistry.

Geoff Dougherty
Professor of Physics
PhD in Biophysics, University of Keele, 1979
Professor of Medical Imaging since 1990
Extensive experience in medical imaging, image analysis, and bioengineering.

Philip Hampton
Professor of Chemistry
PhD in Chemistry, 1989, Stanford University
Chemistry Professor since 1991
Extensive experience in research and education in chemistry.

Ivona Grzegorczyk
Professor of Mathematics
PhD in Mathematics, 1990, UC Berkeley
Mathematics Professor since 1992
Extensive experience in mathematics and its applications and mathematics education.

- The resources supporting the BS in Biology will also support the BA program.

4. Additional Support Resources Required

b. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.

We are in the process of hiring additional faculty to cover some of the courses for the program, including Comparative Animal Physiology.

c. The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

No additional resources needed beyond the existing ones to support the BS program.

d. Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.

CSUCI's acquisition of library resources should be sufficient to meet the needs of the program. The program would greatly benefit if the library purchased the full BIOSIS Databases.

e. Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

The expected CSUCI budget, state support and the standard lab fees will be able to cover our normal operational expenses.

5. Abstract of the Proposal and Proposed Catalog Description

Attach an abstract of the foregoing proposal, not to exceed two pages, and a complete proposed catalog description, including admission and degree requirements.

Biology is the study of life, its origins, diversity and intricacies. It emphasizes the relationship between structure and function in living systems and the processes by which organisms grow, reproduce and interact with each other and their environment. The discipline is dynamic and rapidly advancing, particularly in the areas of biotechnology and information technology. The Biology Program provides its students with a strong theoretical foundation in biology, combined with extensive hands-on laboratory experiences using state-of-the-art technology. Students take a series of core courses augmented by upper-division electives selected from areas of special interest.

The Bachelor of Arts degree is designed to obtain a general background in both the concepts and the technical skills of modern biology. Students completing the Bachelor of Arts major will find that their strong general background will allow them flexibility in both completing minor fields of study and career choices. The degree prepares graduates for careers in science education, industry or government.

Degree requirements – see above.

BS in Chemistry

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005
(LONG FORM)

Proposed Name of Degree: Bachelor of Science in Chemistry

Options/ Emphases in the Degree: Biochemistry Option

Faculty Proposing New Program: Philip D. Hampton, PhD; Simone Aloisio, PhD

-

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

1a. ***Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.***

Campus - California State University Channel Islands
Degree - Bachelor of Science in Chemistry
Implementation – Fall 2005

1b. ***Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility***.

Academic Affairs/Multiple Programs

1c. ***Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.***

Philip D. Hampton, PhD
Professor of Chemistry

Simone Aloisio, PhD
Assistant Professor of Chemistry

1d. ***Objectives of the proposed degree major program***.

6. To provide students with a strong undergraduate educational preparation in Chemistry and Biochemistry that is founded on the "Big Ideas" in Chemistry.
7. To enhance students' problem-solving, analytical, oral communication, and written communication skills across the Chemistry curriculum.
8. To encourage team problem-solving and collaboration
9. To develop students' ability to read and understand primary literature
10. To provide students with hands-on exposure to laboratory research through internships and independent research.
11. To prepare students for further study in graduate or professional schools, or for employment in a variety of public and private organizations.

Big Ideas in Chemistry:

1. Geometric Structure: The three dimensional arrangement of atoms in a molecule results in a unique shape which can affect the properties, reactivity, and stability of a molecule, as well as its ability to interact with or bind to another molecule.
2. Electronic Structure: The energies and extent of filling of atomic orbitals and molecular orbitals in an atom or molecule affects the properties, reactivity and stability of an atom/molecule. Electronic structure includes the nature of bonds between atoms and the interaction between orbitals on neighboring or remote atoms.
3. Forces between Molecules: Interactions between groups in a molecule or between molecules can occur over a distance through dispersion forces, dipole-dipole interactions, hydrogen bonding, and crystal packing forces.
4. Thermodynamics: The stability of an atom/molecule influences its reactivity and determines whether an atom/molecule will react with another atom/molecule.
5. Kinetics: The rate at which one atom/molecule reacts with another atom/molecule is influenced greatly by the concentrations of the individual species undergoing the reaction, the rate of collisions between molecules, and by the energy needed for atoms/molecules to react individually or with one another.
6. Reactions: There are four basic ways that molecules react: (1) *Electron-transfer* (redox reactions); (2) *Lone electron sharing* (radical reactions); (3) *Electron pair sharing* (i.e., acid-base reactions, electrophilic/ nucleophilic reactions); and (4) *Concerted Reactions* (i.e., pericyclic reactions).

The Great Ideas of Chemistry were adapted from the following references:

Peter Atkins, *Chemistry: The Great Ideas*, personal communication to P. Hampton, 2003.

Peter Atkins and Loretta Jones, *Chemical Principles.* W.H.Freeman & Co, New York (2002).

Peter Atkins, *The Periodic Kingdom.* Weidenfeld and Nicolson, London (1995).

Peter Atkins, *Galileo's Finger: The 10 Great Ideas of Science.* Oxford University Press (2003)

Student Outcomes:

Through this degree program students will be able to:

1. Explain the "Big Ideas" of Chemistry and discriminate when they can be applied to problems in Chemistry.
2. Evaluate and propose explanations for symbolic, microscopic, and macroscopic (real-life) representations of concepts including their relationship to the "Big Ideas" of Chemistry:
3. Formulate hypotheses and devise and perform experiments to test a hypothesis as individuals and in a team.
4. Explain key concepts in Chemistry effectively through oral and written communication.
5. Interpret, evaluate and criticize the chemical literature.

All upper-division courses in the Chemistry Program require at least one writing assignment to reinforce writing skills developed in freshman composition courses.

As part of its on-going assessment of the Chemistry curriculum, embedded assessment will be used to assess student learning throughout the required courses in the Bachelor of Science in Chemistry. The below matrix identifies how the required courses in the Bachelor of Science in Chemistry reflect the various stages of mastery of the above student outcomes. Numbers refer to the student outcomes identified above and letters refer to the Big Ideas of Chemistry within the student outcomes.

	Required Chemistry Courses										
Student Learning Outcome	**121**	**122**	**250 & 251**	**305**	**311 & 312**	**314 & 315**	**371 & 372**	**460**	**Electives**	**492 or 494**	**499**
1a	*I*	*R*	*R*		*R*	*M*		*M*	*M*	*A*	*A*
1b	*I*	*R*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
1c	*I*	*R*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
1d		*I*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
1e		*I*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
1f		*I*	*R*		*R*	*M*		*M*	*M*	*A*	*A*
2a	*I*	*R*	*R*		*R*	*M*		*M*	*M*	*A*	*A*
2b	*I*	*R*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
2c	*I*	*R*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
2d		*I*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
2e		*I*	*R*		*R*	*R*	*M*	*M*	*M*	*A*	*A*
2f		*I*	*R*		*R*	*M*		*M*	*M*	*A*	*A*
3	*I*	*R*	*R*		*R*	*R*	*R*	*R*	*R*	*M*	*M*
4	*I*	*R*	*R*		*R*	*R*	*R*	*R*	*R*	*M*	*M*
5				*I*	*R*	*R*	*R*	*R*	*R*	*M*	*M*

I = Student Learning Outcome is *Introduce*d in this course
R = Student Learning Outcome is *Reinforced* in this course
M = Student Learning Outcome is *Mastered* in this course
A = Student Learning Outcome is *Applied* to a research problem in this course

1e. ***Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

120 Semester units required for the major.

BACHELOR OF SCIENCE IN CHEMISTRY

Lower Division Requirements (28 units)

CHEM 121	General Chemistry I	(4 units)
CHEM 122	General Chemistry II	(4 units)
CHEM 250	Quantitative Analysis	(2 units)
CHEM 251	Quantitative Analysis Laboratory	(2 units)
MATH 150	Calculus I	(4 units)
MATH 151	Calculus II	(4 units)
PHYS 100	Introduction to Physics I	
or PHYS 200	General Physics I	(4 units)
PHYS 101	Introduction to Physics II	
or PHYS 201	General Physics II	(4 units)

Upper-Division Requirements (20 units)

CHEM 305	Computer Applications in Chemistry	(1 unit)
CHEM 311	Organic Chemistry I	(3 units)
CHEM 312	Organic Chemistry I Laboratory	(1 unit)
CHEM 314	Organic Chemistry II	(3 units)
CHEM 315	Organic Chemistry II Laboratory	(1 unit)
CHEM 371	Physical Chemistry I	(3 units)
CHEM 372	Physical Chemistry Laboratory	(1 unit)
CHEM 460	Biochemistry I	(4 units)
CHEM 492	Internship/ Service Learning	
or CHEM 494	Independent Research	(2 units)
CHEM 499	Capstone Project	(1 unit)

Upper-Division Chemistry Electives (22 units)

A total of 22 units of electives, excluding courses numbered 330-349 (except CHEM 341) or 430-449, including a minimum of three laboratory courses. No more than 2 units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) can be used as electives. CHEM 341 may be used as an elective toward the degree.

Total Units in the Bachelor of Science in Chemistry 70 units

TOTAL UNITS FOR GRADUATION

I.	Lower Division Required		28
II.	Upper Division Required		20
III.	Elective Courses in the Chemistry Major		22
V.	Upper Division Required Interdisciplinary General Education		6-9
	• In Chemistry Major	0-3	
	• Outside of Chemistry Major	6-9	
VI.	Other General Education (GE)		30
VII.	Title V		6
VIII.	University Electives		5-8
Total			**120**

Required Chemistry Major Courses Fulfilling GE Category Requirements

A-1 Oral Communication
No applicable course from the Chemistry Major

A-2 Writing Communication
No applicable course from the Chemistry Major

A-3 Critical Thinking
No applicable course from the Chemistry Major

B-1 Physical Sciences
CHEM 121 General Chemistry I *OR*
CHEM 122 General Chemistry II *OR*
PHYS 100 Introduction to Physics I *OR*
PHYS 200 General Physics I

B-2 Life Sciences
No applicable course from the Chemistry Major (non-Biochemistry Option)
Biochemistry Option:
BIOL 200 Principles of Organismal and Population Biology

B-3 Mathematics
MATH150 Calculus I

B-4 Computers and Information Technology
CHEM 305 Computer Applications in Chemistry

C-1 Fine Arts
No applicable course from the Chemistry Major

C-2 Literature
No applicable course from the Chemistry Major

C-3a Language
No applicable course from the Chemistry Major

C-3b Multicultural
No applicable course from the Chemistry Major

D Social Perspectives
No required course from the Chemistry Major
One course (three units) in this category may be met with Chemistry Electives (CHEM 326 or 341). CHEM 341 also satisfies the upper-division, interdisciplinary General Education requirement
CHEM 326 Scientific and Professional Ethics *OR*
CHEM 341 Drug Discovery and Development

E Human Psychological and Physiological Perspectives

No applicable course from the Chemistry Major

COURSE DESCRIPTIONS FOR CATALOG

COURSES IN THE CHEMISTRY PROGRAM

* = existing courses
1 = needed in first year of initiation of program
2 = needed during the first two years after implementation

CHEM 121 GENERAL CHEMISTRY I (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: A passing score on the Chemistry Placement Examination or CHEM 105
An introductory chemistry course which provides an overview of the chemical and physical behavior of matter with a focus on qualitative and quantitative general inorganic, physical, and analytical chemistry. Lab fee required.
GenEd: B1

CHEM 122 GENERAL CHEMISTRY II (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 121 with a grade of C or better
An introductory chemistry course which provides an overview of the chemical and physical behavior of matter with a focus on quantitative general inorganic, physical, and analytical chemistry including kinetics and thermodynamics of reactions, gas phase and solution equilibria, and qualitative aspects of radiochemistry, organic chemistry, and polymer chemistry. Lab fee required.
GenEd: B1

CHEM 250 QUANTITATIVE ANALYSIS (2)*
Two hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better
Co-requisite: CHEM 251
An examination of the theory and techniques involved in the quantification of inorganic, organic, and biological species from samples with an emphasis on the environmental, biological, and medical applications of the analysis techniques.

CHEM 251 QUANTITATIVE ANALYSIS LABORATORY (2)*
Six hours of laboratory per week
Prerequisite: CHEM 122 with a grade of C or better
Co-requisite: CHEM 250
A laboratory course designed to provide students with an exposure to the techniques used in the quantification of inorganic, organic, and biological species from samples using gravimetric and volumetric analyses, potentiometric titrations, atomic absorption spectrometry, UV-visible spectroscopy, GC, and GC/MS. Lab fee required.

CHEM 305 COMPUTER APPLICATIONS IN CHEMISTRY (1)
One hour of activity per week.
Prerequisite: CHEM 122 with a grade of C or better.
Introduction to using computer applications to solve chemical problems and present scientific information. The course introduces the student to on-line journals and literature searches, reading and understanding the scientific literature, computer modeling of molecules, and website development. Lab fee required.
Gen Ed. – B4

CHEM 311 ORGANIC CHEMISTRY I (3)*
Three hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better
The structure and reactions of simple organic molecules and spectroscopic techniques (NMR, GC-MS, IR, and UV-visible) used to characterize molecules. Lab fee required.

CHEM 312 ORGANIC CHEMISTRY I LABORATORY (1)*
Three hours laboratory per week
Prerequisite: CHEM 311 (or taken concurrently) with a grade of C or better
A laboratory course designed to provide students with an exposure to the techniques and instrumentation (NMR, GC, GC-MS, LC, IR, and UV-visible) used to purify and characterize organic molecules resulting from organic reactions. Lab fee required.

CHEM 314 ORGANIC CHEMISTRY II (3)*
Three hours lecture per week
Prerequisite: CHEM 311 with a grade of C or better
An examination of the structure, reactions, and spectroscopy of organic compounds containing one or more functional groups, and the structures and reactions of biologically relevant molecules.

CHEM 315 ORGANIC CHEMISTRY II LABORATORY (1)*
Three hours laboratory per week
Prerequisite: CHEM 311, 312, and 314 (or taken
concurrently) with grades of C or better
A laboratory course designed to provide students with experience in single-step and multi-step syntheses and characterization of organic molecules with hands-on access to instrumentation (NMR, GC, GC-MS, LC, IR, and UV-visible). Lab fee required.

CHEM 371 PHYSICAL CHEMISTRY I (3)[1]
Three hours lecture per week.
Prerequisite: CHEM 122 with a grade of C or better, PHYS 101 or PHYS 201, and MATH 150.
Designed to introduce the student to thermodynamics and kinetics. Areas covered will include the laws of thermodynamics, changes in state, chemical equilibrium, gas kinetic theory and rates of reactions. The will also be discussion on experimental methods used to determine chemical reaction rates.

CHEM 372 PHYSICAL CHEMISTRY LABORATORY (1)[1]
Three hours lab per week.
Prerequisite: CHEM 371 (or concurrent registration)
Designed to introduce the student to experimental physical chemistry determining thermodynamics and kinetics. This class will provide a laboratory for the material covered in CHEM 371. Lab fee required.

CHEM 460 BIOCHEMISTRY I (4)*
Three hours lecture and three hours laboratory per week.
Prerequisite: CHEM 314 with a grade of C or better
Introduction to the physical and chemical properties of proteins and enzymes, and enzymatic catalysis and inhibition. Lab fee required.

CHEM 492 INTERNSHIP/SERVICE LEARNING (1-3)*
Prerequisite: Consent of instructor
Provides student credit for internship work and/or service learning in the community that culminates in a written and oral report. Repeatable.

CHEM 494 INDEPENDENT RESEARCH (1-3)*
Prerequisite: Consent of instructor
Provides student credit for independent research (laboratory or library) that culminates in a written and oral report. Repeatable.

CHEM 499 CHEMISTRY CAPSTONE COLLOQUIUM (1)[1]
Prerequisite: CHEM 371; CHEM 305 and CHEM 492 or 494 (or concurrent registration)
Oral and written presentation of work completed or work-in progress projects of CHEM 492, or 494, courses. Graded credit/no-credit.

MATH 150. CALCULUS I (4)*
A course in analytic geometry and calculus. Elementary and transcendental functions are introduced, their properties studied; limits, derivatives, integrals and mathematical modeling used in problem-solving in sciences.

MATH 151. CALCULUS II (4)*
Prerequisite: MATH 150. Topics include: differentiation, integration, sequences, infinite series, and power series. (A lower division requirement in the quantitative economics emphasis.)

PHYS 100 INTRODUCTION TO PHYSICS I (4)*
Three hours lecture and three hours laboratory per week
A non-calculus based introduction to the concepts and principles of physics. The areas covered include classical mechanics, wave motion and thermal physics. Practical examples will be used to illustrate the relationship between physics and other disciplines, especially the life sciences, and to develop problem-solving skills. Laboratory sessions will include computer-simulated experiments. Lab fee required.
GenEd: B1

PHYS 101 INTRODUCTION TO PHYSICS II (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: PHYS 100
A non-calculus based introduction to the concepts and principles of physics. The areas covered include electromagnetic theory, light, and atomic and nuclear physics. Practical examples will be used to illustrate the relationship between physics and other disciplines, especially the life sciences, and to develop problem-solving skills. Laboratory sessions will include computer-simulated experiments. Lab fee required.
GenEd: B1

PHYS 200 GENERAL PHYSICS I (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: MATH 150
A calculus-based introduction to the concepts and principles of physics. The areas covered include classical mechanics, wave motion and thermal physics. Practical examples will be used to illustrate the relationship between physics and other disciplines, including the life sciences, and to develop problem-solving skills.
Laboratory sessions will focus on computer-simulated experiments. Lab fee required.
GenEd: B1

PHYS 201 GENERAL PHYSICS II (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: PHYS 200
A calculus-based introduction to the concepts and principles of physics. The areas covered include electromagnetic theory, light, and atomic and nuclear physics. Practical examples will be used to illustrate the relationship between physics and other disciplines, including the life sciences, and to develop problem-solving skills. Laboratory sessions will focus on computer-simulated experiments. Lab fee required.
GenEd: B1

1f. ***List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

COURSE DESCRIPTIONS FOR CATALOG

* = existing courses
1 = needed in first year of initiation of program
2 = needed during the first two years after implementation

CHEM 123 GENERAL CHEMISTRY I PROBLEM-SOLVING (1)
One hour of recitation per week.
Prerequisite: Must be taken concurrently with CHEM 121
An instructor/peer-supervised interactive problem-solving session for students in CHEM 121 where students work in small groups on problems related to the content in CHEM 121.

CHEM 124 GENERAL CHEMISTRY II PROBLEM-SOLVING (1)
One hour of recitation per week.
Prerequisite: Must be taken concurrently with CHEM 122
An instructor/peer-supervised interactive problem-solving session for students in CHEM 122 where students work in small groups on problems related to the content in CHEM 122.

CHEM 301 ENVIRONMENTAL CHEMISTRY (3)*
Three hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better
An introduction to the chemistry of the environment. The goal of this course is to teach the fundamental natural chemical processes of the atmosphere, oceans, and soil of the Earth; as well as the anthropogenic effects on this system. Current topics of environmental interest will be discussed. The sciences behind these processes will be the focus of this course.

CHEM 313 ORGANIC CHEMISTRY I LEARNING COMMUNITY (1)*
One-hour recitation per week
Co-requisite: CHEM 311
Interactive problem-solving session for students in CHEM 311 where students work in small groups on problems related to the content in CHEM 311.

CHEM 316 ORGANIC CHEMISTRY II LEARNING COMMUNITY (1)*
One-hour recitation per week
Co-requisite: CHEM 314
Interactive problem-solving session for students enrolled in CHEM 314 where students work in small groups on problems related to the content in CHEM 314.

CHEM 326 SCIENTIFIC AND PROFESSIONAL ETHICS (3)*
Three hours lecture per week
Discussion of ethical issues and societal challenges derived from scientific research and professional activities. Examines the sources, fundamental principles, and applications of

ethical behavior; the relationship between personal ethics and social responsibility of organizations; and the stakeholder management concept. Applies ethical principles to different types of organizations: business, non-profits, government, health care, science/technology, and other professional groups. Topics also include integrity of scientific research and literature and responsibilities of scientists to society, intellectual property, ethical practices in professional fields, ethical dilemmas in using animal or human subjects in experimentation, gene cloning, animal cloning, gene manipulation, genetic engineering, genetic counseling, and ethical issues of applying biotechnology in agricultural fields. Emphasizes cases to explore ethical issues. Same as BIOL 326 and MGT 326
GenEd: D and Interdisciplinary

CHEM 341 DRUG DISCOVERY AND DEVELOPMENT (3)*
Three hours lecture per week
How are drugs discovered? What determines the price for a drug? What is the difference between a generic and non-generic drug? These questions will be examined with an interdisciplinary approach. Topics include the isolation of compounds from natural sources, the screening of compounds for biological activity, structure-activity relationships of drugs, computer-assisted drug design, combinatorial chemistry, bioinformatics, the FDA approval process for new drugs, and the economic and business aspects of pharmaceutical investment and development. Same as BUS 341 and ECON 341.
GenEd: B1, D and Interdisciplinary

CHEM 373 PHYSICAL CHEMISTRY II (3)[2]
Three hours lecture per week.
Prerequisite: CHEM 122 with a grade of C or better, PHYS 101 or PHYS 201, and MATH 150.
Designed to introduce the student to quantum mechanics, atomic and molecular structure, spectroscopy, and statistical mechanics.

CHEM 410 ADVANCED ORGANIC SYNTHESIS (4)[2]
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 314, CHEM 315, and CHEM 305 (or concurrent or consent of instructor)
Modern synthetic reactions and approaches in the design of complex organic molecules. Laboratory expands on content in CHEM 312 and 315 and introduces students to advanced synthetic reactions and techniques, including inert-atmosphere techniques. Lab fee required.

CHEM 415 MOLECULAR STRUCTURE DETERMINATION (4)[1]
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 314, CHEM 315, and CHEM 305 (or concurrent or consent of instructor)
Modern techniques for the determination of organic, inorganic, and biological molecular structure using X-ray crystallography, nuclear magnetic resonance spectroscopy, mass

spectrometry, infrared spectroscopy, ultraviolet spectroscopy, and molecular modeling. Lab fee required.

CHEM 450 INSTRUMENTAL ANALYSIS AND LABORATORY (4)[2]
Three hours lecture and three hours lab per week.
Prerequisite: CHEM 250, CHEM 251, CHEM 305 (or concurrent or consent of instructor), and CHEM 315 with a grade of C or better
Designed to introduce the student to chemical analysis using instrumental methods. Areas covered will include atomic and molecular spectroscopy, chromatography, and mass spectroscopy. Lectures will focus on theory and application of these techniques to organic, inorganic, and biochemical analysis. There will also be attention paid to experimental design, materials used in scientific apparatus, vacuum science and electronic circuits. The laboratory experiments are designed to complement the lecture material. Students will design some of their own experiments in this class. Lab fee required.

CHEM 461 BIOCHEMISTRY II (4)[1]
Three hours lecture and three hours laboratory per week.
Prerequisite: CHEM 460 with a grade of C or better; CHEM 305 (or concurrent or consent of instructor)
Introduction to the biosynthesis of proteins and nucleic acids, biosynthetic and metabolic pathways, photosynthesis, and gene expression. Lab fee required.

CHEM 465 BIOINORGANIC CHEMISTRY (3)[2]
Three hours lecture.
Prerequisite: CHEM 314 with a grade of C or better, and CHEM 305 (or concurrent or consent of instructor)
The inorganic chemistry of biological systems including the role of metals such as zinc, iron, copper, manganese, and molybdenum in protein/ enzyme function. The course will discuss principles of coordination chemistry, protein and DNA functional groups and their metal-binding ability, and the role of metal ions in the reaction mechanisms of metalloenzymes.

CHEM 490 SPECIAL TOPICS IN CHEMISTRY (1-3)*
Prerequisite: Consent of instructor
Specialized topics from the fields of Chemistry and Biochemistry. Repeatable by topic.

CHEM 497 DIRECTED STUDIES (1-3)*
Prerequisite: Consent of instructor
Provides student credit for curricular activities under the direction of a Chemistry faculty member. Repeatable.

1g. ***If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.***

Biochemistry Option: Instead of 22 units of Chemistry electives, students take 8 additional units of lower-division biology requirements and 12 additional units of upper-division chemistry and biology requirements for a total of 70 units in the option.

BIOCHEMISTRY OPTION

Chemistry Lower Division and Upper Division Requirements for the Bachelor of Science Degree (48 units)

Additional Lower Division Requirements (8 units)

BIOL 200	Principles of Organismal and Population Biology	(4 units)
BIOL 201	Principles of Cell and Molecular Biology	(4 units)

Additional Upper-Division Requirements (12 units)

BIOL 300	Cell Physiology	(4 units)
BIOL 400	Molecular Biology and Molecular Genetics	(4 units)
CHEM 461	Biochemistry II	(4 units)

Upper-Division Chemistry Electives (2 units)

A total of 2 units of electives, excluding courses numbered 330-349 or 430-449. Two units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) or CHEM 341 may be used as electives toward the degree.

Total Units in the Bachelor of Science in Chemistry, Biochemistry Option 70 units

TOTAL UNITS FOR GRADUATION: BIOCHEMISTRY OPTION

I.	Lower Division Requirements		28
II.	Upper Division Requirements		20
III.	Required Option Courses		20
IV.	Chemistry Electives		2
IV.	Upper Division Required Interdisciplinary General Education		9
	• In Chemistry Major	0	
	• Outside of Chemistry Major	9	
V.	Other General Education (GE)		27
VI.	Title V		6
VII.	University Electives		8
Total			**120**

ADDITIONAL REQUIRED COURSES IN THE BIOCHEMISTRY OPTION

* = existing courses
1 = needed in first year of initiation of program
2 = needed during the first two years after implementation

BIOL 200 PRINCIPLES OF ORGANISMAL AND POPULATION BIOLOGY (4)*
Three hours lecture and three hours laboratory per week
An introduction to organismal biology including the diversity, comparative structure, organ system function, development, phylogeny, taxonomy and systematics of prokaryotes, protists, fungi, plants and animals. Discussion of the principles of evolution including speciation and natural selection, the environmental impact and ecosystem interaction of plants and animals, the behavior of animals, population genetics and population biology. A lab fee is required.
GenEd: B2

BIOL 201 PRINCIPLES OF CELL AND MOLECULAR BIOLOGY (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 105 or CHEM 121
This course will cover principles of basic chemistry, biological macromolecules, prokaryotic and eucaryotic cell structure and function, homeostasis, metabolism including both respiration and photosynthesis, cell division, signal transduction, Mendelian genetics, molecular genetics including transcription and translation, and a brief introduction to virology and immunology. The philosophy of science, scientific method and experimental design are foundational to the course. A lab fee is required.
GenEd: B2

BIOL 300 CELL PHYSIOLOGY (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 122; CHEM 311 and 312 or concurrent enrollment; BIOL 201 with a grade of C or better
Detailed study of the organization and functioning of cells and cellular organelles at the cellular and molecular levels, emphasizing experimental approaches and structural and functional relationships and their regulation and control. Topics include macromolecules, membrane phenomena, metabolism, enzyme kinetics, and cellular events associated with excitable cells and tissues. A lab fee is required.

BIOL 400 MOLECULAR BIOLOGY AND MOLECULAR GENETICS (4)*
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 314 and 315, 318 or 400; BIOL 300 or 302 with a grade of C or better
Study of informational macromolecules and how they direct molecular processes in both eukaryotic and prokaryotic cells. Topics include structure, function and regulation of the genetic material at the molecular level, gene organization, structures and functions of

DNA, RNA and proteins, gene transcription and expression, RNA processing, genomics and proteomics. A lab fee is required.

CHEM 461 BIOCHEMISTRY II (4)[1]
Three hours lecture and three hours laboratory per week.
Prerequisite: CHEM 400 with a grade of C or better
Introduction to the biosynthesis of proteins and nucleic acids, biosynthetic and metabolic pathways, photosynthesis, and gene expression. Lab fee required.

1h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.

Course Title	Prerequisites
BIOL 300 – Cell Physiology	BIOL 201, CHEM 121, CHEM 311 and 312 (or taken concurrently)
BIOL 400 – Molecular Biology	BIOL 300 or 302, CHEM 314, CHEM 315, CHEM 318 or 400
CHEM 122 – General Chemistry II	CHEM 121
CHEM 250 and 251 – Quantitative Analysis	CHEM 122
CHEM 301 – Environmental Chemistry	CHEM 122
CHEM 305 – Computer Applications in Chemistry	CHEM 122
CHEM 311 – Organic Chemistry I	CHEM 122
CHEM 312 – Organic Chemistry Laboratory I	CHEM 311 (or taken concurrently)
CHEM 314 – Organic Chemistry II	CHEM 311
CHEM 315– Organic Chemistry Laboratory II	CHEM 314 (or taken concurrently)
CHEM 371 – Physical Chemistry I	CHEM 122, PHYS 101 or 201, MATH 150
CHEM 372 – Physical Chemistry Laboratory	CHEM 371 (or concurrent registration)
CHEM 373 – Physical Chemistry II	CHEM 122, PHYS 101 or 201, MATH 150

CHEM 410 – Advanced Organic Synthesis	CHEM 314, CHEM 315, and CHEM 305 (or concurrent or permission)
CHEM 415 – Molecular Structure Determination	CHEM 314, CHEM 315, and CHEM 305 (or concurrent or permission)
CHEM 450 – Instrumental Analysis	CHEM 250, CHEM 251, CHEM 315, and CHEM 305 (or concurrent or permission)
CHEM 460 – Biochemistry I	CHEM 314
CHEM 461 – Biochemistry II	CHEM 460 and CHEM 305 (or concurrent or permission)
CHEM 465 – Bioinorganic Chemistry	CHEM 314 and CHEM 305 (or concurrent or permission)
CHEM 499 – Chemistry Capstone Colloquium	CHEM 371; CHEM 492, or CHEM 494 (or concurrent registration); and CHEM 305 (or concurrent or permission)

1i. ***Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.***

The program focuses on the "Big Ideas" of Chemistry and requires a hands-on learning experience through the Capstone Project. Students receiving this degree will participate in an applied or basic research project in the field of chemistry. The options for this are through independent research (laboratory or library), via a service learning project, or an internship. The students will present their work, both written and orally, in their capstone course. Writing throughout the curriculum is included in the Bachelor of Science degree.

The program also implements the distinguishing characteristics of all CSUCI programs: interdisciplinarity, a service learning approach, a co-operative learning component, teamwork, and a strong general education preparation.

1j. ***For undergraduate programs, provisions for articulation of the proposed major with community college programs.***

See attached spreadsheet for articulation agreements.

1k. ***Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.***

The major accrediting body for this degree is the ACS (American Chemical Society). To obtain an ACS accredited degree would require "significant breadth and depth" in the five major areas of chemistry: Biochemistry, and Analytical, Inorganic, Organic, and Physical Chemistry. Significant upper division lab work in four of these areas (excluding biochemistry) is required, with additional guidelines needed for an accredited biochemistry degree. While the courses in this degree provide a solid fundamental framework in the field of chemistry, with most of the courses filling some requirements for ACS accreditation, these requirements are not fully met, and ACS accreditation is not sought after at this time. Additional courses, including Inorganic Chemistry and integrated laboratories, will be added over the four years after implementation of this degree program and an ACS certified option will be added to the Bachelor of Science in Chemistry which will meet the ACS accreditation guidelines.

2. Need for the Proposed Degree Major Program

2a. ***List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program***.

Currently, 20 of the 23 CSU campuses offer a degree in chemistry. The two that do not, besides CSUCI, are: CSU Maritime Academy, and CSU Monterey Bay. California Lutheran University is a private institution in Ventura County offers a degree in chemistry.

2b. ***Differences between the proposed program and programs listed in Section 2a above***.

This program will provide an opportunity for residents the local area to earn a state-supported CSU degree in chemistry. The program is distinctive in that the each class in the curriculum follows emphasizes the "Big Ideas" of chemistry. Students will be introduced to these themes in their first-year classes (General Chemistry), and this central theme will continue to be emphasized in the core and elective classes of the major. This curriculum focuses on the fundamentals, giving the students the knowledge, skills, and experience they need to be successful. The mechanism by which the students learn the "Big Ideas" is consistent with the values of CSUCI: interdisciplinarity, a service learning approach, learning cooperatively, teamwork, and a strong general education.

2f. ***Professional uses of the proposed degree major program***.

The student receiving a Bachelor of Arts in Chemistry will be prepared to enter the workforce, both public and private, in a variety of organizations. The local community offers above the average number of opportunities for employment for a student receiving this degree. The degree will also prepare students for further education, both graduate and professional. It is common for students with this degree to pursue further education in medical, dental, veterinary, and pharmacological studies, as well as specialized fields like patent law.

2g. ***The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.***

	Number of Majors	Number of Graduates
Initiation Year	8	0
Third Year	12	6
Fifth Year	20	14

3. Existing Support Resources for the Proposed Degree Major Program

3a. ***Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program***.

Philip Hampton
Professor of Chemistry
Ph.D. Chemistry, 1989

Simone Aloisio
Assistant Professor of Chemistry
Ph.D. Chemistry, 2000

Ching-Hua Wang
Professor of Biology
M.D., 1978
Ph.D., 1986

Louise Lutze-Mann
Associate Professor of Biology
Ph.D., 1983

Nancy Mozingo
Assistant Professor of Biology
Ph.D. Zoology, 1993

Amy Denton
Assistant Professor of Biology
Ph.D. Botany, 1997

Geoff Dougherty
Professor of Physics
Ph.D. Biophysics, 1979

Ivona Grzegorczyk
Professor of Mathematics
Ph.D. Mathematics, 1990

Nikolaos Diamantis
Assistant Professor of Mathematics
Ph.D. Mathematics, 1997

Jorge Garcia
Assistant Professor of Mathematics
Ph.D.

Jesse Elliot
Assistant Professor of Mathematics
Ph.D.

4. Additional Support Resources Required

4b. ***Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.***

No additional faculty or staff support positions are needed to implement the proposed program.

4c. ***The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy***.

The major requires no additional lecture or laboratory space to initiate. Existing facilities in the Science Building, along with future facilities in the Science Annex will provide the necessary laboratory space.

4d. ***Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.***

No additional library resources needed above the existing CSUCI Library acquisition program. The faculty is working with the Library staff to assure an appropriate level and subject distribution of library resources.

4e. ***Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.***

No additional needs beyond those planned are required to implement the program. Group II funds from the Science Annex building will be used to purchase equipment needs for the first two years after initiation of the program.

5. Abstract of the Proposal and Proposed Catalog Description

CHEMISTRY

PROGRAMS OFFERED

- Bachelor of Arts in Chemistry
- Bachelor of Science in Chemistry
- Bachelor of Science in Chemistry, Option in Biochemistry
- Minor in Chemistry
- Certificate in Chemistry

The Chemistry Program at CSUCI is based on a "Big Ideas" approach to the discipline. Students will learn how to apply the "Big Ideas" skills to their analysis of concepts and problems. In addition to implementing the "Big Ideas" across the curriculum, students learn how to improve their analytical thinking, oral and written communication, and problem solving skills as individuals and in teams. The required courses in Chemistry degree provide breadth across the sub-disciplines of Analytical, Inorganic, Organic, and Physical Chemistry. The culmination of the degree involves a capstone project in conjunction with a service learning project, internship, or independent research experience. Writing skills are developed in all upper-division Chemistry courses.

CAREERS

Graduates from the Bachelor of Arts or Bachelor of Science in Chemistry will receive an excellent preparation for securing entrance to a pre-professional program (i.e., pre-medical, pre-veterinary, pre-dentistry, or pre-pharmacy), to graduate school in Chemistry or Biochemistry, and for employment in the academic, private, or public sector as Chemists, Biochemists, Forensic Scientists, and Materials Scientists.

The Bachelor of Arts in Chemistry is designed to provide a broad preparation in the Chemical Sciences and this degree is an excellent preparation for pre-professional (premedical, pre-dental, pre-pharmacy, and pre-veterinary) careers or graduate school in Chemistry. Required courses prepare students in four of the five traditional sub-disciplines of Chemistry: analytical, inorganic, organic, and physical chemistry. The Bachelor of Arts in Chemistry can serve as the depth of study necessary for securing a Single Subject Credential in Science for teaching at the high school and middle school level.

The Bachelor of Science in Chemistry provides the depth and breadth in the Chemical Sciences that is recommended for graduate study or for a career in Chemistry. Students who graduate with the BS in Chemistry will be extremely well-prepared for working at pharmaceutical companies or other chemical industries. Required courses provide depth of knowledge in all of the sub-disciplines of Chemistry: biochemistry and analytical, inorganic, organic, and physical chemistry.

The Minor in Chemistry provides non-majors with the Chemistry background that is needed to pursue graduate study or a career in an interdisciplinary field. Students in pre-professional programs (pre-medical, pre-dental, pre-veterinary, pre-pharmacy), or majoring in Biology or Environmental Science and Resource Management, in particular, should consider obtaining a Chemistry minor, since a significant portion of the coursework needed for the Chemistry minor is included in these programs.

The Certificate in Chemistry is designed to provide individuals who have already obtained a B.A. or B.S. degree in another discipline with the opportunity to obtain a certificate for advanced Chemistry coursework that is equivalent to a minor in Chemistry.

FACULTY

-
- Philip D. Hampton, PhD
- Professor of Chemistry
- Academic Advisor for the Chemistry Program
- Science Building Room 206
- Phone: (805) 437-8869
- Email: Philip.Hampton@csuci.edu
-
- Simone Aloisio, PhD
- Assistant Professor of Chemistry
- Academic Advisor for the Chemistry Program
- Science Building Room 207
- Phone: (805) 437-8999
- Email: Simone.Aloisio@csuci.edu
-
- **ADDITIONAL FACULTY**
-

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Geoffrey Dougherty, Ph.D.
Professor of Physics
Science Building Room 102

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Nancy Mozingo, Ph.D.
Assistant Professor of Biology
Science Building Room 205
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Email: nancy.mozingo@csuci.edu

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE IN CHEMISTRY (120 UNITS)

Lower Division Requirements (28 Units)

1. Chemistry
   - CHEM 121 General Chemistry I (4)
   - CHEM 122 General Chemistry II (4)
   - CHEM 250 Quantitative Analysis (2)
   - CHEM 251 Quantitative Analysis Laboratory (2)

2. Math
   - MATH 150 Calculus I (4)
   - MATH 151 Calculus II (4)

3. Physics
   - PHYS 100 Introduction to Physics I or
     PHYS 200 General Physics I (4)
   - PHYS 101 Introduction to Physics II or
     PHYS 201 General Physics II (4)

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Upper Division Requirements (20 Units)

CHEM 305 Computer Applications in Chemistry (1)
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
CHEM 371 Physical Chemistry I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 460 Biochemistry I (4)
CHEM 492 Internship/ Service Learning
or CHEM 494 Independent Research (2)
CHEM 499 Capstone Project (1)

(9 units of the above courses will be counted toward lower-division General Education Categories B1, B3, and B4)

Upper Division Chemistry Electives (22)

A total of 22 units of electives, excluding courses numbered 330-349 (except CHEM 341) or 430-449, including a minimum of three laboratory courses. No more than 2 units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) can be used as electives. CHEM 341 may be used as an elective toward the degree.

CHEM 123	General Chemistry I Problem-Solving (1)
CHEM 124	General Chemistry II Problem-Solving (1)
CHEM 301	Environmental Chemistry (3)
CHEM 313	Organic Chemistry I Learning Community (1)
CHEM 316	Organic Chemistry II Learning Community (1)
CHEM 341	Drug Discovery and Development (3)
CHEM 346	Scientific and Professional Ethics (3)
CHEM 410	Advanced Organic Synthesis (4)
CHEM 415	Molecular Structure Determination (4)
CHEM 450	Instrumental Analysis (4)
CHEM 460	Biochemistry I (4)
CHEM 461	Biochemistry II (4)
CHEM 465	Bioinorganic Chemistry (3)
CHEM 473	Physical Chemistry II (3)
CHEM 490	Special Topics in Chemistry (1-3)
CHEM 492	Internship/ Service Learning (1-3)
CHEM 494	Independent Research (1-3)
CHEM 497	Directed Studies (1-3)

Required Supporting and Other GE Courses (42 – 45 units)
American Institutions Requirement (6)
Other Courses in GE Categories A-E (36* – 39)
*Three units of General Education Category D may be included as Chemistry Electives (CHEM 326 or 341)

Electives in Any Discipline (5 – 8* units)

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE IN CHEMISTRY, BIOCHEMISTRY OPTION (120 UNITS)

Lower Division Requirements (36 Units)

1. Chemistry
   - CHEM 121 General Chemistry I (4)
   - CHEM 122 General Chemistry II (4)
   - CHEM 250 Quantitative Analysis (2)
   - CHEM 251 Quantitative Analysis Laboratory (2)

2. Biology
   - BIOL 200 Principles of Organismal and Population Biology (4)
   - BIOL 201 Principles of Cell and Molecular Biology (4)

3. Math
   - MATH 150 Calculus I (4)
   - MATH 151 Calculus II (4)

4. Physics
   - PHYS 100 Introduction to Physics I or
     PHYS 200 General Physics I (4)
   - PHYS 101 Introduction to Physics II or
     PHYS 201 General Physics II (4)

Upper Division Requirements (32 Units)

1. Chemistry

   - CHEM 305 Computer Applications in Chemistry (1)
   - CHEM 311 Organic Chemistry I (3)
   - CHEM 312 Organic Chemistry I Laboratory (1)
   - CHEM 314 Organic Chemistry II (3)
   - CHEM 315 Organic Chemistry II Laboratory (1)
   - CHEM 371 Physical Chemistry (3)
   - CHEM 372 Physical Chemistry Laboratory (1)
   - CHEM 460 Biochemistry I (4)
   - CHEM 461 Biochemistry II (4)
   - CHEM 492 Internship/ Service Learning
     or CHEM 494 Independent Research (2)
   - CHEM 499 Capstone Project (1)

2. Biology

BIOL 300 Cell Physiology (4)
BIOL 400 Molecular Biology and Molecular Genetics (4)

(12 units of the above requirements will be counted toward lower-division General Education Categories B1, B2, B3, and B4)

Upper Division Chemistry Electives (2)

A total of 2 units of electives, excluding courses numbered 330-349 or 430-449. Two units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) or CHEM 341 may be used as electives toward the degree.

CHEM 123 General Chemistry I Problem-Solving (1)
CHEM 124 General Chemistry II Problem-Solving (1)
CHEM 301 Environmental Chemistry (3)
CHEM 313 Organic Chemistry I Learning Community (1)
CHEM 316 Organic Chemistry II Learning Community (1)
CHEM 341 Drug Discovery and Development (3)
CHEM 346 Scientific and Professional Ethics (3)
CHEM 410 Advanced Organic Synthesis (4)
CHEM 415 Molecular Structure Determination (4)
CHEM 450 Instrumental Analysis (4)
CHEM 460 Biochemistry I (4)
CHEM 461 Biochemistry II (4)
CHEM 465 Bioinorganic Chemistry (3)
CHEM 473 Physical Chemistry II (3)
CHEM 490 Special Topics in Chemistry (1-3)
CHEM 492 Internship/ Service Learning (1-3)
CHEM 494 Independent Research (1-3)
CHEM 497 Directed Studies (1-3)

Required Supporting and Other GE Courses (39 – 42 units)
American Institutions Requirement (6)
Other Courses in GE Categories A-E (33* – 36)
*Three units of General Education Category D may be included as Chemistry Electives (CHEM 326 or 341)

Electives in Any Discipline (5 – 8* units)

PROPOSED COURSE OF STUDY

Bachelor of Science in Chemistry

FIRST YEAR (31 Units)

FALL (14 Units)
Composition and Rhetoric (ENGL 102 or ENGL 105); GE Category A-2 (3)
Critical Reasoning; GE Category A-3 (3)
CHEM 121 General Chemistry I; GE Category B-1 (4)
MATH 150 Calculus I; GE Category B-3 (4)

SPRING (17 Units)
University Elective or ENGL 103 (3)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)
Foreign Language Requirement; GE Category C-3a (3)
University Elective (3)

SECOND YEAR (29 Units)

FALL (14 Units)
Oral Communication; GE Category A-1 (3)
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
Social Science, General Education Requirement; GE Category D (3)
Physics requirement (PHYS 100 or 200); (4)

SPRING (15 Units)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
Social Science, General Education Requirement; GE Category D (3)
Physics requirement (PHYS 101 or 201); (4)
CHEM 305 Computer Applications in Chemistry; GE Category B-4 (1)
U.S. History; Title V (3)

THIRD YEAR (30 Units)

FALL (16 Units)
CHEM 371 Physical Chemistry (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 460 Biochemistry I (3)
Life Science, General Education Requirement; GE Category B-2 (3)*
Literature, General Education Requirement; GE Category C-2 (3)*
Multicultural General Education Requirement; GE Category C-3b (3)*

SPRING (14 Units)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Human Physiological and Psychological Perspectives, General Education Requirement; GE Category E (3)*
Social Science, General Education Requirement; GE Category D (3)*
Chemistry Elective, Laboratory (4)

FOURTH YEAR (32 - 33 Units)

FALL (16 Units)
Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (*may include CHEM 326 or 341 which satisfy GE Category D);* (3)
Social Science, General Education Requirement; GE Category D (*if not satisfied with CHEM 326 or 341, otherwise University Elective*); (3)*
Chemistry Elective, Lecture (3)
American Institutions Requirement; Title V (3)

SPRING (14 Units)
Visual and Performing Arts, General Education Requirement; GE Category C-1 (3)*
Chemistry Elective, Lecture (3)
Chemistry Elective, Lecture (3)
CHEM 492 Internship/ Service Learning or 494 Independent Research (2)
CHEM 499 Chemistry Colloquium (1)

Note to Students: To maximize University Electives, it is recommended that the nine units of upper-division, interdisciplinary general education courses (numbered 330-349 or 430-449) be taken from those courses marked with an asterisk (*), in order to meet simultaneously Categories A-E and the nine units of Upper-Division General Education.

Bachelor of Science in Chemistry, Biochemistry Option

FIRST YEAR (28 Units)

FALL (14 Units)
Composition and Rhetoric (ENGL 102 or ENGL 105); GE Category A-2 (3)
Critical Reasoning; GE Category A-3 (3)
CHEM 121 General Chemistry I; GE Category B-1 (4)
MATH 150 Calculus I; GE Category B-3 (4)

SPRING (14 Units)
University Elective or ENGL 103 (3)
Oral Communication; GE Category A-1 (3)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)

SECOND YEAR (31 Units)

FALL (15 Units)
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
Physics requirement (PHYS 100 or 200); (4)
Foreign Language Requirement; GE Category C-3a (3)
BIOL 200 Principles of Organismal and Population Biology; GE Category B-2 (4)

SPRING (16 Units)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
CHEM 305 Computer Applications in Chemistry, General Education Requirement; GE Category B-4 (1)
Physics requirement (PHYS 101 or 201) (4)
BIOL 201 Principles of Cell and Molecular Biology (4)
U.S. History; Title V (3)

THIRD YEAR (29 Units)

FALL (15 Units)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
CHEM 460 Biochemistry I (4)
Social Science, General Education Requirement; GE Category D (3)
BIOL 300 Cell Physiology (4)

SPRING (14 Units)

CHEM 371 Physical Chemistry (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 461 Biochemistry II (4)
Human Physiological and Psychological Perspectives, General Education Requirement; GE Category E (3)*
Social Science, General Education Requirement; GE Category D (3)*

FOURTH YEAR (32 Units)

FALL (15 Units)
BIOL 400 Molecular Biology and Genetics (4)
Chemistry Elective (2)
Visual and Performing Arts, General Education Requirement; GE Category C-1 (3)*
American Institutions Requirement; Title V (3)
Literature, General Education Requirement; GE Category C-2 (3)*

SPRING (17 Units)
CHEM 499 Chemistry Colloquium (1)
Capstone Requirement (CHEM 492 or 494) (2)
Social Science, General Education Requirement; GE Category D (3)*
Social Science, General Education Requirement; GE Category D (3)*
Multicultural General Education Requirement; GE Category C-3b (3)*
University Elective (3)
University Elective (2)

To maximize University Electives, it is recommended that the nine units of upper-division, interdisciplinary general education courses (numbered 330-349 or 430-449) be taken from those courses marked with an asterisk (*), in order to meet simultaneously Categories A-E and the nine units of Upper-Division General Education.

REQUIREMENTS FOR THE MINOR IN CHEMISTRY (23 units)

Lower Division Requirements (8 units):
CHEM 121 General Chemistry I and Laboratory (4)
CHEM 122 General Chemistry II and Laboratory (4)

Upper Division Requirements (8 units):
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)

Electives (7 units):
A total of 7 units of electives on the 300-400 level or CHEM 250 and CHEM 251; a maximum of three units of an upper-division interdisciplinary General Education course (CHEM 330-349 or CHEM 430-449) and/ or one unit of a Learning Community course (CHEM 313 or 316) can be applied to the Chemistry minor. Interdisciplinary General Education courses that are cross-listed with Chemistry can be counted toward the Chemistry minor.

REQUIREMENTS FOR THE CERTIFICATE IN CHEMISTRY (23 units)

Lower Division Requirements (8 units):
CHEM 121 General Chemistry I and Laboratory (4)
CHEM 122 General Chemistry II and Laboratory (4)

Upper Division Requirements (8 units):
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)

Electives (7 units):
A minimum of seven units of courses with the CHEM prefix to include CHEM 250 and 251 or other upper-division CHEM prefix courses, but excluding upper-division general education courses (CHEM 330-349 or 430-449). A maximum of one unit of a Learning Community course (CHEM 313 or 316) may be applied toward the Certificate.

COURSE LIST:

-

CHEM 100 CHEMISTRY AND SOCIETY (3)
Three hours lecture and three hours laboratory per week
An introduction to the basic principles of chemistry and a consideration of the benefits and problems arising from applications of chemistry. Discussions of foods and food additives, drugs, plastics and other materials of everyday life, fuel sources, the atmosphere, and fresh water. Lab fee required.
GenEd: B1

CHEM 105 INTRODUCTION TO CHEMISTRY (3)
Three hours lecture per week
Prerequisite: A passing score on the ELM Examination
Introduces the basic principles and concepts in Chemistry. Topics covered include: measurements, units and unit conversion, scientific notation, stoichiometry, atomic structure, the concept of the mole, types of compounds, and problem solving.

- GenEd: B1
-

CHEM 121 GENERAL CHEMISTRY I (4)
Three hours lecture and three hours laboratory per week
Prerequisite: A passing score on the Chemistry Placement Examination or CHEM 105
An introductory chemistry course which provides an overview of the chemical and physical behavior of matter with a focus on qualitative and quantitative general inorganic, physical, and analytical chemistry. Lab fee required.
GenEd: B1

CHEM 122 GENERAL CHEMISTRY II (4)
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 121 with a grade of C or better
An introductory chemistry course which provides an overview of the chemical and physical behavior of matter with a focus on quantitative general inorganic, physical, and analytical chemistry including kinetics and thermodynamics of reactions, gas phase and solution equilibria, and qualitative aspects of radiochemistry, organic chemistry, and polymer chemistry. Lab fee required.
GenEd: B1

CHEM 123 GENERAL CHEMISTRY I PROBLEM-SOLVING (1)
One hour of recitation per week.
Prerequisite: Must be taken concurrently with CHEM 121
An instructor/peer-supervised interactive problem-solving session for students in CHEM 121 where students work in small groups on problems related to the content in CHEM 121.

CHEM 124 GENERAL CHEMISTRY II PROBLEM-SOLVING (1)
One hour of recitation per week.
Prerequisite: Must be taken concurrently with CHEM 122
An instructor/peer-supervised interactive problem-solving session for students in CHEM 122 where students work in small groups on problems related to the content in CHEM 122.

CHEM 250 QUANTITATIVE ANALYSIS (2)
Two hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better
Co-requisite: CHEM 251
An examination of the theory and techniques involved in the quantification of inorganic, organic, and biological species from samples with an emphasis on the environmental, biological, and medical applications of the analysis techniques.

CHEM 251 QUANTITATIVE ANALYSIS LABORATORY (2)
Six hours of laboratory per week
Prerequisite: CHEM 122 with a grade of C or better
Co-requisite: CHEM 250
A laboratory course designed to provide students with an exposure to the techniques used in the quantification of inorganic, organic, and biological species from samples using gravimetric and volumetric analyses, potentiometric titrations, atomic absorption spectrometry, UV-visible spectroscopy, GC, and GC/MS. Lab fee required.

CHEM 301 ENVIRONMENTAL CHEMISTRY (3)
Three hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better
An introduction to the chemistry of the environment. The goal of this course is to teach the fundamental natural chemical processes of the atmosphere, oceans and soil of the Earth, as well as the anthropogenic effects on this system. Current topics of environmental interest will be discussed. The sciences behind these processes will be the focus of this course.

CHEM 305 COMPUTER APPLICATIONS IN CHEMISTRY (1)
One hour of activity per week.
Prerequisite: CHEM 122 with a grade of C or better.
Introduction to using computer applications to solve chemical problems and present scientific information. The course introduces the student to on-line journals and literature searches, reading and understanding the scientific literature, computer modeling of molecules, and website development. Lab fee required.
Gen Ed. – B4

CHEM 311 ORGANIC CHEMISTRY I (3)
Three hours lecture per week
Prerequisite: CHEM 122 with a grade of C or better

The structure and reactions of simple organic molecules and spectroscopic techniques (NMR, GC-MS, IR, and UV-visible) used to characterize molecules. Lab fee required.

CHEM 312 ORGANIC CHEMISTRY I LABORATORY (1)
Three hours laboratory per week
Prerequisite: CHEM 311 (or taken concurrently) with a grade of C or better
A laboratory course designed to provide students with an exposure to the techniques and instrumentation (NMR, GC, GC-MS, LC, IR, and UV-visible) used to purify and characterize organic molecules resulting from organic reactions. Lab fee required.

CHEM 313 ORGANIC CHEMISTRY I LEARNING COMMUNITY (1)
One-hour recitation per week
Co-requisite: CHEM 311
Interactive problem-solving session for students in CHEM 311 where students work in small groups on problems related to the content in CHEM 311.

CHEM 314 ORGANIC CHEMISTRY II (3)
Three hours lecture per week
Prerequisite: CHEM 311 with a grade of C or better
An examination of the structure, reactions, and spectroscopy of organic compounds containing one or more functional groups, and the structures and reactions of biologically relevant molecules.

CHEM 315 ORGANIC CHEMISTRY II LABORATORY (1)
Three hours laboratory per week
Prerequisite: CHEM 311, 312, and 314 (or taken
concurrently) with grades of C or better
A laboratory course designed to provide students with experience in single-step and multi-step syntheses and characterization of organic molecules with hands-on access to instrumentation (NMR, GC, GC-MS, LC, IR, and UV-visible). Lab fee required.

CHEM 316 ORGANIC CHEMISTRY II LEARNING COMMUNITY (1)
One-hour recitation per week
Co-requisite: CHEM 314
Interactive problem-solving session for students enrolled in CHEM 314 where students work in small groups on problems related to the content in CHEM 314.

CHEM 341 DRUG DISCOVERY AND DEVELOPMENT (3)
Three hours lecture per week
How are drugs discovered? What determines the price for a drug? What is the difference between a generic and non-generic drug? These questions will be examined with an interdisciplinary approach. Topics include the isolation of compounds from natural sources, the screening of compounds for biological activity, structure-activity relationships of drugs, computer-assisted drug design, combinatorial chemistry, bioinformatics, the FDA approval process for new drugs, and the economic and business

aspects of pharmaceutical investment and development. Same as BUS 341 and ECON 341.
GenEd: B1, D and Interdisciplinary

CHEM 343 FORENSIC SCIENCE (3)
Two hours of lecture and one three-hour lab per week. Lab fee required.
Prerequisite: None
A survey of the various chemical and biological techniques used in obtaining and evaluating criminal evidence. Topics include: chromatography; mass spectrometry (LC-MS, GC-MS); atomic absorption spectrometry; IR, UV, fluorescence, and X-ray spectroscopies; fiber comparisons; drug analysis; arson/ explosive residue analysis; toxicological studies; psychological profiling; blood typing; DNA analysis; population genetics; firearm identification; and fingerprint analysis.
Same as BIOL 343. GenEd-ID: B1

CHEM 344 ENERGY AND SOCIETY (3)
Three hours lecture per week
Survey of the physical, chemical, and engineering principles involved in the production of energy from current and potential sources and the economical, environmental, and political issues surrounding energy production. The course will also examine factors that influence worldwide energy policy. Examples of topics included: energy conservation, efficient usage and transportation of energy, energy resources, fossil fuels, active and passive solar energy, biomass, fuel cells, nuclear (fission and fusion) processes, and hydroelectric, tidal, geothermal, and wind power. Same as PHYS 344
GenEd: B1 and Interdisciplinary

CHEM 346 SCIENTIFIC AND PROFESSIONAL ETHICS (3)
Three hours lecture per week
Discussion of ethical issues and societal challenges derived from scientific research and professional activities. Examines the sources, fundamental principles, and applications of ethical behavior; the relationship between personal ethics and social responsibility of organizations; and the stakeholder management concept. Applies ethical principles to different types of organizations: business, non-profits, government, health care, science/technology, and other professional groups. Topics also include integrity of scientific research and literature and responsibilities of scientists to society, intellectual property, ethical practices in professional fields, ethical dilemmas in using animal or human subjects in experimentation, gene cloning, animal cloning, gene manipulation, genetic engineering, genetic counseling, and ethical issues of applying biotechnology in agricultural fields. Emphasizes cases to explore ethical issues. Same as BIOL 346 and MGT 346
GenEd: D and Interdisciplinary

CHEM 371 PHYSICAL CHEMISTRY (3)
Three hours lecture per week.
Prerequisite: CHEM 122 with a grade of C or better, PHYS 101 or PHYS 201, and MATH 150.

Designed to introduce the student to thermodynamics and kinetics. Areas covered will include the laws of thermodynamics, changes in state, chemical equilibrium, gas kinetic theory and rates of reactions. The will also be discussion on experimental methods used to determine chemical reaction rates.

CHEM 372 PHYSICAL CHEMISTRY LABORATORY (1)
Three hours lab per week.
Prerequisite: CHEM 371 (or concurrent registration)
Designed to introduce the student to experimental physical chemistry determining thermodynamics and kinetics. This class will provide a laboratory for the material covered in CHEM 371. Lab fee required.

CHEM 373 PHYSICAL CHEMISTRY II (3)
Three hours lecture per week.
Prerequisite: CHEM 122 with a grade of C or better, PHYS 101 or PHYS 201, and MATH 150.
Designed to introduce the student to quantum mechanics, atomic and molecular structure, spectroscopy, and statistical mechanics.

CHEM 410 ADVANCED ORGANIC SYNTHESIS (4)
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 314, CHEM 315, and CHEM 305 (or concurrent or consent of instructor)
Modern synthetic reactions and approaches in the design of complex organic molecules. Laboratory expands on content in CHEM 312 and 315 and introduces students to advanced synthetic reactions and techniques, including inert-atmosphere techniques. Lab fee required.

CHEM 415 MOLECULAR STRUCTURE DETERMINATION (4)
Three hours lecture and three hours laboratory per week
Prerequisite: CHEM 314, CHEM 315, and CHEM 305 (or concurrent or consent of instructor)
Modern techniques for the determination of organic, inorganic, and biological molecular structure using X-ray crystallography, nuclear magnetic resonance spectroscopy, mass spectrometry, infrared spectroscopy, ultraviolet spectroscopy, and molecular modeling. Lab fee required.

CHEM 450 INSTRUMENTAL ANALYSIS AND LABORATORY (4)
Three hours lecture and three hours lab per week.
Prerequisite: CHEM 250, CHEM 251, CHEM 305 (or concurrent or consent of instructor), and CHEM 315 with a grade of C or better
Designed to introduce the student to chemical analysis using instrumental methods. Areas covered will include atomic and molecular spectroscopy, chromatography, and mass spectroscopy. Lectures will focus on theory and application of these techniques to organic, inorganic, and biochemical analysis. There will also be attention paid to experimental design, materials used in scientific apparatus, vacuum science and

electronic circuits. The laboratory experiments are designed to complement the lecture material. Students will design some of their own experiments in this class. Lab fee required.

CHEM 460 BIOCHEMISTRY I (4)
Three hours lecture and three hours laboratory per week.
Prerequisite: CHEM 314 with a grade of C or better
Introduction to the physical and chemical properties of proteins and enzymes, and enzymatic catalysis and inhibition. Lab fee required.

CHEM 461 BIOCHEMISTRY II (4)
Three hours lecture and three hours laboratory per week.
Prerequisite: CHEM 460 with a grade of C or better; CHEM 305 (or concurrent or consent of instructor)
Introduction to the biosynthesis of proteins and nucleic acids, biosynthetic and metabolic pathways, photosynthesis, and gene expression. Lab fee required.

CHEM 465 BIOINORGANIC CHEMISTRY (3)
Three hours lecture.
Prerequisite: CHEM 314 with a grade of C or better, and CHEM 305 (or concurrent or consent of instructor)
The inorganic chemistry of biological systems including the role of metals such as zinc, iron, copper, manganese, and molybdenum in protein/ enzyme function. The course will discuss principles of coordination chemistry, protein and DNA functional groups and their metal-binding ability, and the role of metal ions in the reaction mechanisms of metalloenzymes.

CHEM 490 SPECIAL TOPICS IN CHEMISTRY (1-3)
Prerequisite: Consent of instructor
Specialized topics from the fields of Chemistry and Biochemistry. Repeatable by topic.

CHEM 492 INTERNSHIP/SERVICE LEARNING (1-3)
Prerequisite: Consent of instructor
Provides student credit for internship work and/or service learning in the community that culminates in a written and oral report. Repeatable.

CHEM 494 INDEPENDENT RESEARCH (1-3)
Prerequisite: Consent of instructor
Provides student credit for independent research (laboratory or library) that culminates in a written and oral report. Repeatable.

CHEM 497 DIRECTED STUDIES (1-3)
Prerequisite: Consent of instructor
Provides student credit for curricular activities under the direction of a Chemistry faculty member. Repeatable.

CHEM 499 CHEMISTRY CAPSTONE COLLOQUIUM (1)
Prerequisite: CHEM 371; CHEM 305 and CHEM 492 or 494 (or concurrent registration)
Oral and written presentation of work completed or work-in progress projects of CHEM 492 or 494 courses. Graded credit/no-credit.

PROGRAM PROPOSAL

Proposed Name of Degree/Credential: Education Specialist: Mild/Moderate Disabilities Credential Level II

Faculty Proposing New Program: Jill Leafstedt, Maria Denney, Joan Karp

Review and Approval:

Signature of Proposer:_____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

1a. ***Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.***

Campus - California State University Channel Islands

Degree – Education Specialist: Mild/Moderate Credential Level II

Implementation – Fall 2005

1b. ***Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility***.

Academic Affairs- Education Program

1c. ***Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.***

Jill M. Leafstedt, Ph.D.
Assistant Professor of Special Education

Maria K. Denney, Ph.D.
Assistant Professor of Special Education

Joan Karp, Ph.D.
Professor of Special Education
Chair of Education Programs

1d. ***Objectives of the proposed degree major program***.
Learning Objectives

Students completing the Education Specialist: Mild/Moderate Disabilities Credential Level II Program will be able to:

1. Provide advanced levels of instruction to students with disabilities
2. Use research based instructional strategies
3. Make instructional decisions based on formal and informal assessment data
4. Effectively manage classrooms using high quality behavior management strategies
5. Demonstrate leadership in their school district based on an area of specialization within the field of special education
6. Effectively communicate and collaborate with families and professionals
7. Effectively advocate for students with disabilities and their families

1e. ***Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

15-17 Semester units required for the Education Specialist: Mild/Moderate Disabilities Credential Level II Program.

COURSES:

SPED 640 Induction Planning and Support	1
SPED 641 Advanced Perspectives in Special Education	3
SPED 642 Advanced Behavior and Environmental Support	3
SPED 643 Advanced Assessment and Instructional Practices for Diverse Learners	3
SPED 646 Advanced Collaborative Partnerships and Effective Communication in School Settings	3
SPED 647 Transition and Career Education	1
SPED 649 Induction Evaluation	1

COURSE DESCRIPTIONS:

SPED 640 Induction Planning and Support (repeatable)
Development of a Level II Profesional Induction Plan in collaboration with a University Supervisor and a District Support Provider. The plan will include university and non-university components. The plan will identify the candidate's professional area of specialization and area of need. The induction plan will build upon the theoretical and practical knowledge gained in the Education Specialist Level I program and guide the candidate in developing a specific emphasis within the field of special education.

SPED 641 Advanced Perspectives in Special Education
This course prepares teachers and administrators to remain abreast of effective advanced practices in the field of special education. Students will demonstrate knowledge and abilities to interpret apply and disseminate current and emerging research, theory, legislation, policy and practice related to special education

SPED 642 Advanced Behavior and Environmental Support
Examination and analyzis of theories, research, and best practices of behavior and environmental support for students with disabilities within their own school settings.

SPED 643 Advanced Assessment and Instructional Practices for Diverse Learners
This field based seminar course builds upon students knowledge and skills of assessment and instructional methodology learned in their level I Education Specialist credential. Students have the opportunity to discuss and review current practices in special education

on the local, state and national level. Students review current trends in multicultural and bilingual special education, augmentative communication, data-based decision making, early intervention, outcomes assessments, technology and other areas that effect special education practices for students with mild/moderate disabilities.

SPED 646 Advanced Collaborative Partnerships and Effective Communication in School Settings
Examination and analysis of theories, research, and best practices for collaborative partnerships and effective communication within their own school settings and, professional and family environments.

SPED 647 Transition and Career Education
Students in this seminar will gain an understanding of transition planning and career education for students with disabilities. Students will demonstrate the ability to write and implement successful transition plans for students transitioning out of public education. Students will learn about career services for people with disabilities available from educational and community agencies

SPED 649 Induction Evaluation
This field based seminar course will evaluate and finalize candidates' Professional Level II Induction Plan and Professional Development Portfolio. The candidate will work with his/her University Supervisor and District Support Provider to demonstrate and/or document proficiency in the California State Standards for Education Specialists. The candidate will provide evidence for professional development within an area of need and area of specialization as determined in SPED 641.

1f. ***List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

N/A

1g. ***If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.***

N/A

1h. ***Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.***

Requirements for Admission to the Education Specialist level II

CBEST verification

Education Specialist: Mild/Moderate Disabilities Credential Level I

Cumulative grade point average of 3.0 in post baccalaureate or graduate work

Two letters of recommendation from professionals who are knowledgeable about the candidate's professional work, at least one of whom is the candidate's current supervisor or administrator. Letters from university faculty describing the candidate's ability to successfully complete graduate work are also recommended.

Interview with the Education Programs Admissions Committee

Writing Sample. A written statement of purpose in a 400-600 word essay. This essay includes reflections on personal and professional goals, and how the candidate plans to acquire the knowledge and skills in order to achieve these goals.

Evidence of Employment as a Special Education Teacher. The Educational Specialist: Mild/Moderate Disabilities Credential Level II requires the student to be employed as a Special Education Teacher.

Program Maintenance Requirements:

As a condition of remaining in the program, students must maintain a grade point average of 3.0 (B) or better with no course grades lower than a C+. The progress of students in meeting this requirement and in progressing toward completion in a timely manner will be monitored at the conclusion of each semester as part of the Induction Planning and Evaluation courses SPED 640 & 641.

1i. ***Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.***

This program is designed to provide specific preparation for special education teachers in our region including, Southern Santa Barbara and Ventura Counties. The preparation of a fully credentialed special education teacher takes two steps: first a candidate completes an initial credential, called the Education Specialist: Mild/Moderate Disabilities Credential Level I. Once a candidate secures a teaching position with their Level I Credential, they must complete two years of additional teaching with accompanying university-level coursework and mentoring in the classroom. This program during the initial two years of teaching is called the Education Specialist: Mild/Moderate Disabilities Credential Level II. The level II coursework builds on the students' initial training in their Level I program. The Level II Credential Program provides a structure for students to connect their classroom teaching to theory and practice. The Level II Credential Program provides the candidate with the opportunity to develop advanced teaching skills under the guidance of a university supervisor and a school district support provider, all of which leads to the Level II Credential.professional.

1j. ***For undergraduate programs, provisions for articulation of the proposed major with community college programs*.**

N/A

1k. ***Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation reques****t.*

As required by the state of California the Education Specialist: Mild/Moderate Disabilities Credential Level II Program was specifically designed to meet the latest standards of the California Commission on Teacher Credentialing for the Education Specialist level II Credential. It will be submitted to the Commission as soon as it is approved by the Curriculum Committee and Senate.

2. Need for the Proposed Degree Major Program

There exists a critical shortage of credentialed special education teachers in the region, the State of California, and the nation. . Local superintendents have expressed a clear need for credentialed special education teachers to fill vacant positions in the school districts throughout Southern Santa Barbara and Ventura Counties. Additionally, Education Specialists with a Level I Credential are required by the State of California to complete a Level II Credential within five years.

2a. ***List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program***.

Other CSU campuses that offer the Education Specialist Level II Credential include. Nearby institutions offering this credential include California Lutheran University and California State University Northridge (CSUN). Until 2004, the CSUN at Channel Islands Program offered the Level II Credential in Ventura County and Santa Barbara Counties. Presently, CSUCI assumes the the responsibility from CSUN to offer the Education Specialist: Mild/Moderate Disability Credential Level I and II to students in our region.

2b. ***Differences between the proposed program and programs listed in Section 2a above***.

The Education Specialist: Mild/Moderate Disabilities Credential Level II Program is designed to meet the latest California Commission on Teacher Credentialing Standards. The Program is also designed with a broad national perspective while taking into account the regional need for well-qualified special education

teachers. To this end the CSUCI program is similar to other local programs because they must all meet the same CCTC standards.

2f. ***Professional uses of the proposed degree major program***.
The Education Specialist: Mild/Moderate Disabilities Credential Level II will provide advanced preparation for professionals in the field of special education. The Education Specialist: Mild/Moderate Disabilities Credential Level II will specifically provide the specialized knowledge, skills, and practice for special education teachers to become experts and assume leadership roles in their respective schools.

2g. ***The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.***

	Number of Students	Number of Graduates
Initiation Year	20	5
Third year	40	20
Fifth year	40	25

3. Existing Support Resources for the Proposed Degree Major Program

3a. ***Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program***.

Jill M. Leafstedt
Assistant Professor of Special Education
PhD in Education, 2002
CSUCI 1 year
5 years as an educator including, special day class teacher, first grade teacher and Full Inclusion specialist
Publications (See attached vita)

Maria K. Denney
Assistant Professor of Special Education
Ph.D. in Education with an Emphasis in Special Education, Disability and Risk Studies, 2003
CSUCI 1.5 years
10 years as a child development specialist and early interventionist
Publications (See attached vita)

Joan M. Karp
Professor of Special Education
PhD in Special Education, 1982

25 years experience in higher education including professor and administrator at University of Minnesota 12 years, CSUCI 3 years
Publications (See attached vita)

4. Additional Support Resources Required

The Education Specialist: Mild/Moderate Disabilities Credential Level II Program will require classroom space, library materials, library electronic databases, and the use of Information Technology (IT) resources. The IT requirements will not be extensive - mainly PCs for faculty and student use, PC Lab and "smart classrooms" wired for PCs screen projections and Web-based instruction. There are no special laboratory needs.

This program expects the University to provide the following campus resources for students, faculty and staff: parking, offices, food service, health services and key academic support resources (e.g., admission, advising, records, etc.).

4b. ***Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.***

During 2005, CSUCI anticipates hiring additional tenure track faculty members to assist in offering the Education Specialist Level II Program. Since this program will offer one course and field experience each semester for one cohort of students, we anticipate needing one full-time equivalent faculty with expertise in special education and field supervision in order to coordinate this cohort during the initial years. In the next three to five years as the program grows, we anticipate needing 2 full-time equivalent faculty in the special education program. This program will also require a support coordinator at a minimum of 20% time to support the coordination of the Education Specialist Level II Program.

4c. ***The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy***.

The program will use the existing classroom space at CSUCI.

4d. ***Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources*.**

Library resources are being acquired for the program. No additional resources above the existing CSUCI Library acquisition program are needed. The Special Education Faculty will work with the Library staff to ensure an appropriate level and subject distribution of library resources. CSUCI maintains a strong inter-library loan program with other CSU and statewide libraries.

4e. ***Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.***

No new needs beyond those planned during the development of the campus facilities are required.

5. Abstract of the Proposal and Proposed Catalog Description

The Education Specialist: Mild/Moderate Disabilities Level II Credential Program at CSUCI is an advanced professional training program for Special Education Teachers. The California Commission on Teacher Credentialing requires that candidates complete the Level II Credential within five years of completion of a Level I Education Specialist Credential. CSUCI's Level II Program builds on the goals and objectives of our Level I Program. This program focuses on the diversity of students, collaboration between professionals and families, and effective instructional practices for students with disabilities. In alignment with the California State standards, the Level II Program has formed a partnership with local school districts. Candidates for the Level II Credential are employed teachers who in collaboration with their employing school district and the Universitydevelop an induction plan. The induction plan describes the coursework and non-university related professional development activities in which the candidate will participate. Up to 25% of the students induction plan may be completed through non-University activities. During the induction planning stage, the candidate will identify an area of specialization that will be his/her area of focus. University and non-university activities guide the candidate in developing the expertise in the following areas: data-based decision making; behavioral, emotional and environmental supports; current perspectives in special education; transitions from school to work; advanced assessment techniques; curriculum and instruction; and advanced collaboration and consultation with families and professionals.

<u>Option 1: (17 units)</u>
Semester 1

SPED 640 Induction Planning and Support (repeatable)	1
SPED 641 Advanced Perspectives in Special Education	3

Semester 2

SPED 640 Induction Planning and Support (repeatable)	1
SPED 642 Advanced Behavior and Environmental Support	3

Semester 3

SPED 640 Induction Planning and Support (repeatable)	1
SPED 643 Advanced Assessment and Instructional Practices for Diverse Learners	3

Semester 4

SPED 646 Advanced Collaborative Partnerships and Effective Communication in School Settings	3
SPED 649 Induction Evaluation	1
** SPED 647 Transition and Career Education	1

** May be taken at anytime during Level II program

Option 2: (15 units)

Semester 1

SPED 640 Induction Planning and Support	1
SPED 641 Advanced Perspectives in Special Education	3
SPED 646 Advanced Collaborative Partnerships and Effective Communication in School Settings	3

Semester 2

SPED 642 Advanced Behavior and Environmental Support	3
SPED 646 Advanced Collaborative Partnerships and Effective Communication in School Settings	3
SPED 649 Induction Evaluation	1
** SPED 647 Transition and Career Education	1

** May be taken at anytime during Level II program

New Program Consultation Sheet

Program Title: __ Education Specialist: Mild/Moderate Disabilities Credential Level II

Recommend Approval

Program Area/Unit	**Program/Unit Chair**	**YES**	**NO** (attach objections)	**Date**
Art				
Biology				
Business & Economics				
Education				
English				
History				
Liberal Studies				
Mathematics & CS				
Multiple Programs				
Psychology				
Library				
Information Technology				

BA/BS in Applied Physics (Short Form)

PROPOSAL TO CHANGE THE ACADEMIC MASTER PLAN

Proposed Name of Degree: Bachelor of Arts/ Bachelor of Sciences in Applied Physics

Faculty Proposing New Program: Geoff Dougherty, Ivona Grzegorczyk, Peter Smith, William Wolfe, Ching-Hua Wang

Review and Approval:

Date of Proposal: ___ 28th September 2004

Signature of Proposer :_____(Geoff Dougherty)

Date of Faculty Meeting: ___ 12th October 2004
(Please attach announcement to faculty)

Date of Consultation with Academic Affairs Administration:____Early September, 2004

Signature of Academic Affairs Administration : _____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Programs

a. Name of the proposed degree major programs, and academic year of intended implementation.

Bachelor of Arts in Applied Physics
Bachelor of Science in Applied Physics

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Academic Affairs/Biology and Natural Sciences/Physics
Academic Affairs/Mathematics /Physics
Academic Affairs/Computer Science /Physics

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Geoff Dougherty, Professor of Physics
Ivona Grzegorczyk, Professor of Math
William Wolfe, Professor of Computer Science
Ching-Hua Wang, Professor of Biology

d. Objectives of the proposed degree major programs.

General Objectives:

1. To provide students with a strong undergraduate educational preparation in Applied Physics.
2. To prepare students with the fundamental concepts of Physics and the transferable skills (such as analytical thinking and problem solving, oral and written communication skills, the ability to read and understand primary technical/scientific literature, computer literacy and cooperative learning) relevant to a changing work environment.
3. To give students the opportunity to explore selected area(s) in applied physics in greater depth.
4. To provide students with hands-on exposure to laboratory research in applied physics through internships and independent research.

5a. The **B.S. Applied Physics program** is designed for students who wish to pursue a career in physics-related research and development either in industry or in the public sector, or to prepare students for further study in graduate or professional schools in the physical sciences or engineering.

5b. The **B.A. Applied Physics program** is designed for students seeking a broad foundation in applied Physics as part of a liberal education in the arts and sciences: it is particularly appropriate for students interested in such careers as teaching, public service, business, or science journalism. This program does not include the advanced study needed by students who wish to prepare for

careers as physicists, but provides the breadth needed for many other innovative and challenging occupations.

Student Outcomes:

Through these degree programs students will be able to:

1. Demonstrate an understanding of the major concepts in physics.
2. Demonstrate an appropriate level of competency in both computer and research laboratory skills.
3. Formulate hypotheses and devise and perform experiments to test a hypothesis as individuals and in a team.
4. Effectively apply current technology and scientific methodologies for problem solving in various scientific, professional and community settings.
5. Effectively use and critically evaluate current technical/scientific research literature, online information, as well as information related to scientific issues in the mass media.
6. Integrate and relate scientific knowledge learned from classroom with real life situations.
7. Communicate in written and oral forms with interested citizens and professionals on key concepts in Physics and general scientific issues.
8. Maintain life-long learning in the sciences and incorporate new information into the existing body of knowledge.

2. Justification for the Proposed Degree Major Programs

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

Physics is a foundational program in the CSU system, and is offered at 15 of the 23 CSU campuses. The closest CSU program is at Northridge: the closest UC program is at UC Santa Barbara. In addition, three nearby private institutions (California Lutheran University, Pepperdine University and Westmont College) offer degrees in physics.

This proposal is to offer both BA and BS degrees in Applied Physics. The proposed programs are designed specifically to have a distinct applied emphasis (with connections to the majors in Math, Computer Science and Biology, and to the local job market), rather than a theoretical emphasis.

b. Differences between the proposed program and programs listed in Section 2a above.

1. These programs will provide an opportunity for residents in the local area to earn a state-supported CSU degree in Applied Physics.

2. The programs are distinctive in that they will emphasize the applied nature of Physics, and its interdisciplinary applications including medical technology.

3. The programs are organized to include the lower-division core, upper-division core, service learning and capstone courses, whilst maintaining a large number of electives so that students can choose to concentrate in area(s) that particularly interest them.

4. The programs have been designed so that they can each be completed in 120 units, with the required academic rigor, which ensures that students can graduate within 4 years. This is possible because many of the courses are made available as electives, so that the student can modify the program to a large extent to satisfy his/her own needs and interests.

5. In line with the University Mission, the approach taken in these programs will be interdisciplinary. Physics concepts will be taught using examples and applications from other disciplines (e.g. practical optics will be taught in PHYS 208 The Physics of Art and Visual Perception, and wave concepts in PHYS 335 The Physics of Music). The large number of interdisciplinary courses testifies to the rich intersection of physics with other disciplines.

6. Modern applied physics can be taught using the computer and state-of-the-art software as a teaching tool. Prime examples of this are PHYS 345 Digital Image Processing and COMP 432 Computational Bioinformatics. Blackboard is in widespread use: students benefit from have a lesson plan that incorporates a variety of teaching activities, which they can access before, during and after class sessions.

7. The programs contain service learning, independent research and capstone courses (PHYS 490 Topics in Physics and PHYS 499 Senior Capstone Colloquium), all useful vehicles for incorporating community service, learning community activities and outcomes assessment.

8. One of the emphases within the B.S. program will be Medical Imaging, which corresponds with the considerable expertise of our faculty and would be facilitated by the courses already in place for the Medical Imaging Emphasis within the Biology Major. It would also have ties with the new BSIT (Information Technology) program (by virtue of the shared interest in imaging technology), and the planned Nursing program.

9. The programs are supported by local companies such as Rockwell Scientific, who see them as a local source of future applied scientists and engineers, and who have pledged to provide internships and visiting speakers: and Los Robles Medical Center, which has a continuing need to recruit medical imaging specialists.

10. The programs include an elective in PHYS 338 Science and Conscience (team-taught with faculty from the English Department), which explores the

ethical responsibilities of scientists to society. This course attracts students from a variety of disciplines and l incorporates learning community activities.

11. The BS program facilitates students who are interested in doing a double major with Math, Computer Science or Biology by using many courses which are cross-listed with these disciplines: the B.A. program allows students to do a double major with non-science programs such as Business or Art.

12. The programs are strongly computer-oriented and are expected to draw on a different population than other physics programs in the region/state.

13. The programs are designed to constantly engage students as well as faculty to the real issues and concerns of the local communities and the rest of the world through learning community activities, inviting guest lecturers with special experiences and global perspectives, communicating and exchanging with professional scientists.

c. Professional uses of the proposed degree major programs.

About 75% of physics graduates work in science-related jobs, including software, engineering, high school teachers, and managers in technical fields, while the remainder successfully cross into a myriad of occupations which value their numeracy and logical approach to problem-solving.

The BA program in Applied Physics offers preparation for careers in teaching or for careers which combine physics with other disciplines. Careers along both these avenues are in demand locally.

The BS program in Applied Physics offers preparation for careers in industrial and public-sector research and development in such areas as physics, engineering, medical physics, imaging technology, computer science and energy resource management; and for graduate work in physical science or related subjects such as medicine. Such careers are in demand locally. Specialization in various applications can be accomplished by the appropriate selection of electives. Initiatives are underway with other universities to facilitate our graduates in progressing on to postgraduate courses.

d. Community/Regional/Statewide need for the proposed programs.

1. Due to the rapid growth of science and technology based industries locally and nationally, there is a tremendous need for people with a strong training in science, transferable skills and a cross-disciplinary outlook.

2. Locally, CSUCI is located in the center of the high-tech corridor in the Ventura County and near several military bases, which have a high demand for employees with scientific and technological grounding. Due to the high cost of living in Ventura County, companies are concentrating on looking for local graduates.

3. Regionally, CSUCI is one of the CSU campuses within Southern California, which has the largest clusters of high-tech, military and national security services. High-tech companies in this region are experiencing a severe shortage of people with training in science/technology and in medical technology.

4. The program is interdisciplinary in nature and will strengthen and enhance the offerings of existing programs.

5. There have been a number of enquiries from the local community colleges about the possibility of doing a degree in Physics at CSUCI, rather than having to travel further afield or incur large expenses.

6. The program is expected to generate outside funding in the form of grants and contracts, hence bringing additional resources to the university.

e. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	Number of Majors	Number of Graduates
Initiation Year	8 – 12	0
Third year	12 -16	6 - 8
Fifth year	20 - 25	10 -14

3. Resources Needs for the Proposed Degree Major Programs (faculty, instructional, library, other)

a. Existing.

-One tenured physics faculty member with five affiliated faculty from mathematics and computer science
- An undergraduate Physics teaching Lab with computers
- Some library resources

b. Future.

The Physics program currently only has one faculty member and relies on adjunct lecturers to assist in meeting its current commitments. CSUCI is committed to supporting Physics as a subject area, and to hiring new faculty members. The number of new courses required to implement these programs is very modest: some upper division courses will be offered in alternate years.

Since all students are going to be technology literate, some of the courses (or parts thereof) could be offered on-line. This would give an opportunity for local working professionals to participate in the programs.

The programs require no additional lecture or laboratory space to initiate and sustain them over the next five years beyond the existing facilities in the Science Building, and the future facilities earmarked in the Science Annex (viz., two Physics labs and access to additional classrooms).

No additional library resources needed above the existing CSUCI Library acquisition program. The faculty is working with the Library staff to assure an appropriate level and subject distribution of library resources.

The expected CSUCI budget, state support and the standard lab fees will be able to cover the normal operational expenses. Group II funds from the Science Annex building

will be used to purchase equipment needs for the first two years after initiation of the program.

BA in Political Science (Short Form)

PROPOSAL TO CHANGE THE ACADEMIC MASTER PLAN

Proposed Name of Degree: B.A. Political Science

Faculty Proposing New Program: Scott A. Frisch

Review and Approval:

Date of Proposal: November 1, 2004

Signature of Proposer:_____

Date of Faculty Meeting: Academic Master Plan Task Force Meetings 2003-04
(Please attach announcement to faculty)

Date of Consultation with Academic Affairs Administration: September, 2004

Signature of Academic Affairs Administration : _____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

a. Name of the proposed degree major program, and academic year of intended implementation.

B.A. in Political Science

Academic Year 2006-2007

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Political Science Program

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Scott A. Frisch
Associate Professor of Political Science

d. Objectives of the proposed degree major program.

Political Science is the study of government, public policies and political behavior. Political Science uses both humanistic and scientific perspectives and skills to examine all countries and regions of the world. The major in Political Science will be based on the university mission. Courses will be divided into four categories: International Politics (such as international relations, comparative politics, area studies, and American foreign policy); Multicultural and gender Politics (Latino politics, African American Politics, Women and Politics); Interdisciplinary Politics (Politics and Film, Science, Technology and Public Policy, Politics of Economic Policymaking) and Civic and Political Engagement/Service Learning (Capstone). All students will be required to take coursework in all four areas.

All majors will be required to take a Capstone course that will integrate prior learning in a community focused service learning project.

General Objectives

- Provide students with the opportunity to earn a B.A. degree in Political Science from California State University, Channel Islands.
- Provide students interdisciplinary and service learning opportunities.
- Graduate students with multicultural and international perspectives.
- Provide students with the necessary skills and knowledge to enter law school, graduate school, and the public or private sector work force.

Learning Objectives

Students completing the requirements for a B.A. degree in Political Science will be able to:

- Think critically about key issues of public policy and politics
- Write clearly and with purpose on issues of international and domestic politics
- Become civically engaged through experience with a political, governmental or nonprofit organization
- Analyze political and policy problems and formulate policy options
- Use technology and traditional resources to research key local, state, national and international policy issues and present results

2. Justification for the Proposed Degree Major Program

Political Science is a foundation major as listed in Academic Programs and Resource Planning in the California State University, 1980, p. 33.

Political Science is a popular major throughout the California State University system. In academic year 2002-2003, 1,112 Political Science degrees were awarded throughout the system. If programs that are frequently included in a department of Political Science (such as Public Administration, and International Relations) are included in the Political Science total, the number of majors jumps to 1,586. CSUN graduated 93 political science majors in 2003.

a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.

All other CSU campuses offer political science (or Government) except CSU Monterey Bay and the California Maritime Academy.

USC, UCLA and UCSB all offer B.A., M.A. and Ph.D. degrees in Political Science

California Lutheran University offers a B.A. in Political Science

Pepperdine offers a B.A. in Political Science

b. Differences between the proposed program and programs listed in Section 2a above.

Unlike traditional programs in Political Science, the CSUCI B.A. develops breath of knowledge by requiring that students take coursework in four mission related areas – international, multicultural and gender, interdisciplinary, and civic engagement/service learning.

All CSUCI Political Science majors must complete a capstone course that integrates knowledge through undertaking a community oriented service learning project.

c. Professional uses of the proposed degree major program.

The Political Science major will prepare students for careers in federal, state and local governments; law; business; international organizations; nonprofit associations and organizations; campaign management and polling; journalism; education; electoral politics, research and advocacy. In addition, the major in Political Science prepares students for graduate and professional study in the field of Political Science as well as International Relations and Public Administration.

d. Community/Regional/Statewide need for the proposed program.

Ventura County is home to a large number of government employers who would benefit from a four year degree in Political Science. According to the Census Bureau, there are 31,576 state and local government employees in Ventura County as well as 8,700 civilian employees of the federal government and 6,883 military employees of the federal government. Traditionally, government employees have been attracted to the political science degree, especially coursework in public administration. Government employment is considered more stable than many other fields and there is an ongoing need for government services. Anecdotal information

indicates that there is significant demand for a political science major among students already attending CSUCI.

e. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	Number of Majors	Number of Graduates
Initiation Year	20	0
Third year	30	10
Fifth year	50	20

3. Resources Needs for the Proposed Degree Major Program (faculty, instructional, library, other)

a. Existing.

Classroom Space

The CSUCI Library already has the basic electronic databases necessary to begin a political science program – JSTOR, CQ Weekly Report, CQ Researcher, Lexis-Nexis (Congressional Universe), ProQuest, Countrywatch Forecast, Factiva, Rand California. Additional books will need to be purchased to fill out the political science collection.

b. Future.

An additional faculty member will be needed to begin the program.

Additional faculty as the program expands commensurate with growth

Classroom space to accommodate growth

BA in Sociology

PROGRAM PROPOSAL

Proposed Name of Degree/Credential: BA Sociology

Faculty Proposing New Program: Harley Baker, Renny Christopher, Scott Frisch

Review and Approval:

Signature of Proposer:_____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

1a. ***Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.***

Campus - California State University Channel Islands

Degree - BA, Sociology

Implementation – Fall, 2005

1b. ***Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility***.

Sociology

1c. ***Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.***

Harley Baker, Associate Professor of Psychology
Renny Christopher, Professor of English
Scott Frisch, Associate Professor of Political Science
In consultation with Dr. Theodore Wagenaar, Dept of Sociology, Miami University of Ohio

1d. ***Objectives of the proposed degree major program***.

Sociology is the study of the organization, dynamics and consequences of social life. The scope of the discipline is as broad and diverse as social life itself. The Sociology major is designed to give students the ability to analyze the world around them, its people and their institutions. The program will stress interdisciplinarity and the multicultural, global perspective which is the hallmark of Channel Islands programs. Students will develop their abilities to think critically, and to use the empirical methodology of the discipline to engage in the systematic study of human social interaction and institutions. The Sociology major will prepare students for further study and for entry into a variety of professional paths.

Learning objectives for the program:

1. The discipline of sociology and its role in contributing to our understanding of social reality, such that students will be able to:
    a. describe how sociology differs from and is similar to other social sciences as well as other disciplines, and give examples of these differences;
    b. use sociology as part of an interdisciplinary approach to social issues;
    c. describe and illustrate how sociology contributes to a liberal arts understanding of social reality; and
    d. apply the sociological imagination, sociological principles, and sociological concepts to her/his own life.

2. The role of theory in sociology, such that the student will be able to:
    a. define theory and describe its role in building sociological knowledge;
    b. compare and contrast basic theoretical orientations in sociology;
    c. show how theories reflect the historical contexts of the times, places, and cultures in which they were developed;
    d. describe and apply some basic theories or theoretical orientations that are relevant to students' service learning and internship experiences; and
    e. describe and apply some basic theories or theoretical orientations in at least one area of social reality.

3. The role of evidence and qualitative and quantitative methods in sociology, such that the student will be able to:
    a. identify basic methodological approaches and describe the general role of methods in building sociological knowledge;
    b. compare and contrast the basic methodological approaches for gathering data;
    c. design a research study in an area of choice and explain why various decisions were made;
    d. indicate how methodological approaches differ in applied settings; and
    e. critically assess a published research report and explain how the study could have been improved.

4. Basic concepts in sociology and their fundamental theoretical interrelations, such that the student will be able to:
    a. define, give examples, and demonstrate the relevance of the following: culture, social change, social structure, sociological imagination, institutions, socialization, power, and [other basic sociological concepts that the CSUCI sociology faculty deem central]; and
    b. show how these and other concepts are best understood and applied from an interdisciplinary approach.

5. How culture and social structure operate, such that the student will be able to:
    a. show how institutions interlink in their effects on each other and on individuals, and how these linkages vary across cultures;
    b. demonstrate how social change factors such as population or urbanization affect social structures and individuals, and how these effects vary across cultures;
    c. demonstrate how culture and social structure vary across time and place, and the effects of such variations; and
    d. identify examples of specific policy implications using reasoning about social structural effects.

6. Issues of inequality and difference, as they are manifested in differences by subculture, class, age, sexuality, race, ethnicity, gender, and disability such that the student will be able to:
    a. explain the origins of such differences and inequalities;
    b. compare theoretical approaches to these differences and inequalities;
    c. explain the consequences of such differences and inequalities;
    d. show how issues of inequality vary across and within cultures; and
    d. indicate appropriate social policies for addressing such differences and inequalities.

7. The macro/micro distinction, such that the student will be able to:
    a. compare and contrast theories at one level with those at the other;
    b. summarize some research documenting connections between the two; and
    c. develop a list of research or analytical issues that should be pursued to more fully understand the connections between the two.

8. Reciprocal relationships between individuals and society, such that the student will be able to:
    a. explain how the self develops sociologically;

b. demonstrate how societal and structural factors influence individual behavior and the self's development;
c. demonstrate how social interaction and the self influence society and social structure; and
d. distinguish sociological approaches to analyzing the self from psychological, economic, and other approaches, and show how sociology contributes to an interdisciplinary approach.

9. The role of sociology in understanding our multicultural and global world, such that the student will be able to:
   a. illustrate how basic social facts differ across cultures;
   b. demonstrate how social developments in one part of the globe affect social developments in other parts;
   c. connect current events in a society with the cultures and subcultures in that society;
   d. indicate the limitations of an ethnocentric perspective on social reality and how to attenuate such ethnocentrism; and
   e. compare and integrate the sociological perspective on multiculturalism and globalization with the geographical, philosophical, psychological, economic, historical, and other perspectives.

10. In depth at least one area within sociology, such that the student will be able to:
   a. summarize basic questions and issues in the area;
   b. compare and contrast basic theoretical orientations and middle range theories in the area;
   c. show how sociology helps understand the area;
   d. summarize current research in the area; and
   e. develop specific policy implications of research and theories in the area.

11. To think critically, such that the student will be able to:
   a. move easily from recall, analysis, and application to synthesis and evaluation;
   b. identify underlying assumptions in particular theoretical orientations or arguments;
   c. identify underlying assumptions in particular methodological approaches to an issue;
   d. show how patterns of thought and knowledge are directly influenced by political-economic social structures;
   e. present opposing viewpoints and alternative hypotheses on various issues; and
   f. move easily from a the disciplinary perspective of sociology to an interdisciplinary perspective.

12. To develop a positive social consciousness, such that the student will see:
   a. that an interdisciplinary approach provides a more complete perspective on social reality than that provided by separate disciplines;
   b. that sociology contributes a unique view of social reality as part of an interdisciplinary approach; and
   b. the importance of reducing the negative effects of social inequality.

1e. ***Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

Total Units in the major: 39

Required Courses:

Lower Division: (9 units)

SOC 100 INTRODUCTION TO SOCIOLOGY (CAN SOC 2) - (3) (Needed to initiate)
SOC/ PSY 203 STATISTICAL APPLICATIONS IN THE SOCIAL SCIENCES (3) (Needed to initiate)
SOC 201 SOCIAL PROBLEMS IN A SERVICE LEARNING CONTEXT (3) (Needed first two years)

Upper Division: (21 units)

SOC 310 RESEARCH METHODS IN SOCIOLOGY – (3) (Needed to initiate)
SOC/POLS 330 POLITICAL SOCIOLOGY – (3) (Needed to initiate)
SOC 350 STRATIFICATION AND SOCIAL CLASS – (3) (Needed to initiate)
SOC 360 RACE & ETHNICITY– (3) (Needed first two years)
SOC 410 SOCIOLOGY OF GENDER AND SEXUALITY – (3) (Needed first two years)
SOC 420 SOCIOLOGICAL THEORY - (3) (Needed first two years)
SOC 499 CAPSTONE – (3) (Needed first two years)
Upper Division Electives (9)

Catalog Descriptions:

SOC 100 INTRODUCTION TO SOCIOLOGY (CAN SOC 2) (3)
Three hours lecture per week
An introductory study of the basic concepts, theoretical approaches, and methods of sociology. Topics include: the analysis and explanation of social structure, social change, group dynamics, socialization and self, social stratification, and cultural diversity.
GenEd: D

SOC 201 SOCIAL PROBLEMS IN A SERVICE LEARNING CONTEXT (3)
Three hours lecture per week
Examines social problems in the United States from a sociological perspective. Social problems in the community such as homelessness, poverty, and racism will be explored through integrating classroom discussion, lecture, reading and required community service.
GenEd: D

SOC/PSY 203 STATISTICAL APPLICATIONS IN THE SOCIAL SCIENCES (3)
Weekly three-hour lecture/laboratory instruction and exercise.
Prerequisite: A passing score on the Entry Level Mathematics Exam (ELM) or credit for Math 105 (or equivalent).
Course will cover the organization and classification of social science data, graphical representations, central tendency and variability, types of data encountered in the social sciences, chi-squared and other nonparametric techniques, correlation and regression, introduction to statistical inference, mean difference tests and an introduction to analysis of variance. Students will use SPSS to analyze data. Same as PSY 203.
GenEd: B3, B4

Upper Division: (21 units)
SOC 310 RESEARCH METHODS IN SOCIOLOGY (3)
Two hours lecture and two hours laboratory per week
Prerequisite: SOC 100, SOC 203 and, upper division standing
An introduction to the quantitative methods sociologists use to study human societies and their members. Topics include: survey research design, hypothesis formulation, questionnaire and interview design, scaling, sampling, data preparation and statistical analysis of quantitative data through SPSS. The political and ethical issues surrounding social research also will be explored.
SOC/POLS 330 POLITICAL SOCIOLOGY (3)
Three hours lecture per week

Examines power and power structures at all levels of society. The roles of social classes, movements, and institutions in shaping the political process and social influences on political behavior are explored.
GenEd: UDI

SOC 350 SOCIAL STRATIFICATION: THEORIES OF SOCIAL CLASS (3)
Three hours lecture per week
Prerequisite: SOC 100 and 300
Analysis of the distribution of wealth, prestige, and power. Examines various approaches to the study of the causes of poverty, life chances of the poor, lifestyles of the wealthy, upward and downward mobility, and class and group conflict in society.

SOC 360 RACE & ETHNICITY (3)
Three hours lecture per week
Prerequisite: SOC 100
This course examines issue of race, religion, ethnic relations and power in the U.S. and elsewhere. Power, prejudice, and discrimination relating to minority status are emphasized.

SOC 410 SOCIOLOGY OF GENDER AND SEXUALITY (3)
Prerequisite: SOC 100 and 203
Analysis of gender and sexuality in human society with special attention to gendered socialization practices, issues in equality from historic as well as contemporary and cross-cultural perspectives, and sexual identities and behaviors.

SOC 420 INTRODUCTION TO SOCIOLOGICAL THEORY (3)
Prerequisite: SOC100 and upper division standing.
Three hours lecture per week
This course explores the origin and development of classical and contemporary sociological theory from the 19th century to the present. Sociological theory is portrayed as an organized system of accepted knowledge that applies in a variety of circumstances to explain a specific set of phenomena.

SOC 499 CAPSTONE (3)
Three hours lecture per week
Prerequisite: 15 units of upper-division work in Sociology
Involves review of the discipline of sociology and focuses on key issues, including review of the tools of the discipline and the role of sociology in the student's future roles as individual, employee, and citizen. Incorporates a service learning component.

1f. ***List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation. Include proposed catalog descriptions of all new courses.***

The major requires 9 units of electives chosen from the following:

COURSES
PSY 312 SOCIAL PSYCHOLOGY (3) (existing course)
POLS 325 AMERICAN PUBLIC POLICY (3) (existing course)

ESRM 328 INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (3) (existing course)
ANTH 332 HUMAN ECOLOGY (3) (existing course)
BIOL 333 EMERGING PUBLIC HEALTH ISSUES (3) (existing course)
PSY/SPED 345 INDIVIDUALS WITH DISABILITIES IN SOCIETY (3) (existing course)
SOC/ESRM 440 POPULATION/DEMOGRAPHIC STUDIES (3) (Needed first two years)
PSY 445 ADOLESCENT DEVELOPMENT (3) (existing course)
PSY 457 CRIMINAL BEHAVIOR (3) (existing course)
SOC 490 TOPICS IN SOCIOLOGY (3)

COURSE DESCRIPTIONS

SOC/ESRM 440 POPULATION/DEMOGRAPHIC STUDIES (3)
Prerequisites: SOC 100, 203 or equivalents
This course focuses on the basic concepts, skills and issues in demography and population studies. It will apply concepts to contemporary population issues such as family demography and life chances, urban transition, environmental degradation, and economic development.

SOC 490 TOPICS IN SOCIOLOGY (3)
Three hours lecture per week
Prerequisite: consent of instructor
In-depth analysis of topics in sociology. Topics vary. Repeatable by topic.

1g. ***If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.***

None.

1h. ***Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.***

None.

1i. ***Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.***

The Sociology major at CSUCI provides a solid grounding in the tools and substance of sociology. In addition, several aspects of the program are unique. First, the program underscores the importance of civic involvement and experiential learning. Many of the courses require some type of civic involvement and/or experiential learning, and most courses require students to reflect on their roles as citizens. Second, the program is at the forefront of programs that incorporate multiculturalism throughout the program. Every course considers the cultural differences reflected in both the US society as well as in other societies, and encourages students to reflect on their roles within such societies. Globalization and internationalization are central analytical constructs. Third, every course confronts students with the bases of social differences and inequality, including class, gender,

sexuality, race, ethnicity, age, and disability. Fourth, the CSUCI program is unique in that it sets interdisciplinarity center stage instead of at the fringes. Several courses will be cross-listed. The others will consistently show how the sociological approach differs from but must be connected to other perspectives on social reality. Finally, the CSUCI Sociology program gives students applied skills in social policy, applied methodology, and effectiveness in working with and generating data relevant to social agencies and groups. In fact, the presence of an applied methods course is relatively rare among sociology programs.

1j. ***For undergraduate programs, provisions for articulation of the proposed major with community college programs*.**

Three Sociology CAN courses will be transferable to the Sociology major.
CAN 2 Introduction to Sociology will meet the lower-division Introduction to Sociology requirement
CAN 4 Social Problems and CAN 8 Research Methods in Sociology will be transferable as elective credit within the major.

1k. ***Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation reques****t.*

N/A

2. Need for the Proposed Degree Major Program

2a. ***List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program****.*

All other CSU campuses except the Maritime Academy, Monterey Bay (where it is offered as a concentration), and Cal Poly SLO offer BAs in Sociology; 11 campuses also offer an MA in Sociology.

UCSB, UCLA and USC offer a BA, MA & PhD,

California Lutheran offers a minor.
Pepperdine offers a BA.

2b. ***Differences between the proposed program and programs listed in Section 2a above****.*

• Among the nearby universities, the CSUCI program most closely resembles the UCSB program, which is also designed around a core set of courses covering the broad range of core topics from the discipline of sociology and emphasizes a diversity of perspectives, innovative approaches, and emerging aspects of the discipline.
• The CSUCI program is unique in that it will require students to take a number of interdisciplinary courses, consistent with the rich intersection of sociology with

other disciplines.
• The CSUCI program requires a Capstone experience for graduation. This will encourage students to use the knowledge they have gained in the program to engage the world at large, while allowing them to obtain valuable job-related experience. The local community will also benefit by having students involved in service activities.
• The CSUCI program expects to draw on a different student population than other sociology programs in the area.

2f. ***Professional uses of the proposed degree major program***.

A major in sociology can lead to career opportunities in law, management, marketing, public relations, journalism, social work, urban and environmental planning, public services, teaching, corrections, counseling, human resources, state and federal employment, and other professions. Sociology graduates are employed in both the nonprofit and profit sectors. Many business, political science, premed students, and other majors take sociology as a minor or a second major because of the applicability of sociology to their chosen professions. Graduate study can also lead to careers within the academy doing teaching and research, as well as careers doing applied research in social service, public planning, education, mental health, business, and various governmental settings.

2g. ***The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.***

	Number of Majors	Number of Graduates
Initiation Year	30	0
Third year	125	45
Fifth year	250	100

3. Existing Support Resources for the Proposed Degree Major Program

3a. ***Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program***.

New Hire, Professor of Sociology, to begin Fall, 2005

Harley Baker, Associate Professor of Psychology, MA Candidate Sociology, Ed.D. 1999 Education - Organization and Leadership

Professional Experience:
National Center for Education Statistics - Research Fellow (2000-2002)

Personnel Research Psychologist - Federal Government 1998 - 2002
Consortium Research Fellow - 1994 - 1998
Consortium Research Scientist - 2002 - present
Senior Analyst - UC Santa Cruz 1987 - 1993
Senior Research Fellow - American Institutes for Research 1985 - 1987

Scott A. Frisch, Associate Professor of Political Science, Ph.D. Political Science, 1997

Professional Experience:
Assistant Professor of Public Policy and Administration, California State University Bakersfield, 2000-2003
Assistant Professor of Political Science, East Carolina University, 1997-2000
Adjunct Instructor, Division of Political Science and Criminal Justice, California State University Fullerton, 1995-1997
Program Manager, U.S. Department of the Treasury, 1990-1991
Presidential Management Intern, 1988-1990

4. Additional Support Resources Required

4b. ***Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.***
none

4c. ***The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy***.

This major is part of CSUCI's overall Academic Master Plan and growth plan for the campus as a whole.

4d. ***Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.***

Some library resources exist which supported the CSUN@CI sociology program. The library is committed to purchasing Sociological Abstracts, which costs $5,000 a year. The library has budgeted for this.

4e. ***Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after***

initiation. Indicate the source of funds and priority to secure these resource needs.

The program can begin with existing computer and software resources. Within the next two years, CSUCI will need an additional computer lab and appropriate software for the social sciences.

5. Abstract of the Proposal and Proposed Catalog Description

We propose to develop a sociology major that is both traditional and unique. It provides a solid core of courses that the discipline has traditionally addressed. In doing so, it stresses that students learn how to think as sociologists, and that they experience study in depth in the discipline as advocated by various national associations concerned with the liberal arts. The required and elective courses provide a first-rate exposure to the discipline and will excellently prepare students for graduate school.

We also propose to develop a sociology major that is unique. The program stresses civic engagement and multiculturalism in the US and abroad. Every course examines social differences and inequalities and enables students to proactively deal with such differences. Students will use their solid grounding in sociology to blend consistently with the approaches of other disciplines when they examine social issues and problems. All majors will develop applied skills in both research and policy and be given practice in executing these skills.

Catalog description:

PROGRAMS OFFERED:

- Bachelor of Arts in Sociology
- Minor in Sociology

Sociology is the systematic study of the organization, dynamics and consequences of social life. The scope of the discipline is as broad and diverse as social life itself. The Sociology major is designed to give students the ability to analyze the world around them, its peoples, and their institutions. The program will stress interdisciplinarity and the multicultural, global perspective which is the hallmark of Channel Islands programs. Students will develop their abilities to think critically, and to use the empirical and qualitative methodologies of the discipline to engage in the systematic study of human social interaction and institutions. The Sociology major will prepare students for further study and for entry into a variety of professional paths. The major will equip them with applied skills so that they can work with various social agencies. Majors will practice civic engagement and experiential learning, and faculty will use these experiences in their courses to promote the other goals of the program.

CAREERS:

A major in sociology can lead to career opportunities in law, management, marketing, public relations, journalism, social work, urban and environmental planning, public services, teaching, corrections, counseling, human resources, state and federal employment, and other professions. Sociology graduates are employed in both the nonprofit and profit sectors. Many business, political science, premed students, and other majors take sociology as a minor or a second major because of the applicability of sociology to their chosen professions. Graduate study can also lead to careers within the academy doing teaching and research, as well as careers doing applied research in social service, public planning, education, mental health, business, and various governmental settings.

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN SOCIOLOGY (120 units)

Lower Division Requirements (9 units)

SOC 100 INTRODUCTION TO SOCIOLOGY (CAN SOC 2) (3)
SOC/ PSY 203 STATISTICAL APPLICATIONS IN THE SOCIAL SCIENCES (3)
SOC 201 SOCIAL PROBLEMS IN A SERVICE LEARNING CONTEXT (3)

Upper Division Requirements (21 units)
SOC 310 RESEARCH METHODS IN SOCIOLOGY – (3)
SOC/POLS 330 POLITICAL SOCIOLOGY – (3)
SOC 350 STRATIFICATION AND SOCIAL CLASS – (3)
SOC 360 RACE & ETHNICITY– (3)
SOC 410 SOCIOLOGY OF GENDER AND SEXUALITY – (3)
SOC 420 SOCIOLOGICAL THEORY - (3)
SOC 499 CAPSTONE – (3)
Upper Division Electives (9)-Choose from the following list:

- PSY 312 SOCIAL PSYCHOLOGY (3)
- POLS 325 AMERICAN PUBLIC POLICY (3)
- ESRM 328 INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (3)
- ANTH 332 HUMAN ECOLOGY (3)
- BIOL 333 EMERGING PUBLIC HEALTH ISSUES (3)
- PSY/SPED 345 INDIVIDUALS WITH DISABILITIES IN SOCIETY (3)
- SOC/ESRM 440 POPULATION/DEMOGRAPHIC STUDIES (3)
- PSY 445 ADOLESCENT DEVELOPMENT (3)
- PSY 457 CRIMINAL BEHAVIOR (3)
- SOC 490 TOPICS IN SOCIOLOGY (3)

Required Supporting and Other GE courses (81 Units)
American Institutions Requirement (6)
Other GE Courses (45)
Electives (30)

New Program Consultation Sheet

Program Title: _____

Recommend Approval

Program Area/Unit	**Program/Unit Chair**	**YES**	**NO** (attach objections)	**Date**
Art				
Biology				
Business & Economics				
Education				
English				
History				
Liberal Studies				
Mathematics & CS				
Multiple Programs				
Psychology				
Library				
Information Technology				