

**CALIFORNIA STATE UNIVERSITY SAN MARCOS  
NEW PROGRAM PROPOSAL – P Form Signature Pages**

For Curriculum and Scheduling Office Use Only		
D.B.	Catalog	File


COLLEGE/SCHOOL  CoAS  CoBA  CoE  SoN  CSM Discipline

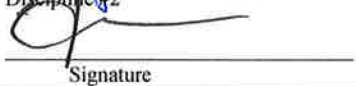
TITLE OF PROGRAM

This form is the signature sheet for new programs and new options/concentrations/tracks within existing programs. For all changes to existing programs (other than addition of new options/concentrations/tracks), use the Form P-2.

- Check one:
- New Undergraduate Major or New Graduate Degree Attach a completed New Program Proposal Template
  - New Option/Concentration/Track
  - New Minor
  - New Teaching Credential
  - New Certificate Attach a completed New Certificate Proposal Template

Does this proposal impact other disciplines?  Yes  No  
If yes, obtain signature(s). Any objections or concerns should be stated in writing and attached to this form. Please check the box to indicate whether a memo has been attached.

<input type="text" value="Chemistry + Biochemistry"/>	<input checked="" type="checkbox"/> Support	<input type="checkbox"/> Oppose	<input type="checkbox"/> Memo attached
Discipline #1			
	<input type="text" value="9/23/13"/>		
Signature	Date		

<input type="text" value="Biological Sciences"/>	<input checked="" type="checkbox"/> Support	<input type="checkbox"/> Oppose	<input type="checkbox"/> Memo attached
Discipline #2			
	<input type="text" value="10/8/13"/>		
Signature	Date		

<input type="text"/>	<input type="checkbox"/> Support	<input type="checkbox"/> Oppose	<input type="checkbox"/> Memo attached
Discipline #3			
<input type="text"/>	<input type="text"/>		
Signature	Date		

<input type="text"/>	<input type="checkbox"/> Support	<input type="checkbox"/> Oppose	<input type="checkbox"/> Memo attached
Discipline #4			
<input type="text"/>	<input type="text"/>		
Signature	Date		

<input type="text"/>	<input type="checkbox"/> Support	<input type="checkbox"/> Oppose	<input type="checkbox"/> Memo attached
Discipline #5			
<input type="text"/>	<input type="text"/>		
Signature	Date		

CALIFORNIA STATE UNIVERSITY SAN MARCOS

P-FORM PREPARATION

1a. [Signature] 10/10/13  
Originator (Please print) Date

1b. [Signature] 10.10.13  
Librarian Liaison for Library Report\* Date

1c. [Signature] 10.10.13  
IITS Liaison for IITS Report\* Date

PROGRAM/DEPARTMENT-LEVEL REVIEW

2. [Signature] 10/10/13  
Program/Department - Director/Chair\* Date

COLLEGE/SCHOOL-LEVEL REVIEW

3. [Signature] 11/7/13  
College/School Curriculum Committee\* Date  
DAVID CHIEN

REVIEW (Signatures must be obtained by proposer)

4a. [Signature] 10/15/13  
Vice President for Student Affairs\* Date  
LOLENA MEZA

4b. [Signature] 10.10.13  
Dean of Library\* Date

4c. [Signature] 10.10.13  
Dean of Information and Instructional Technology Services\* Date  
WAYNE VERES

4d. [Signature] 10-10-13  
Vice President for Finance and Administrative Services\* Date  
LINDA HAWK

4e. [Signature] 10/10/13  
Dean of Graduate Studies (if applicable)\* Date  
GERARDO GONZALEZ

COLLEGE/SCHOOL-LEVEL RECOMMENDATION

5. [Signature] 11/7/13  
College/School Dean/Director\* Date  
RICK FETTER

UNIVERSITY-LEVEL REVIEW

(May not begin until all signatures numbered 1-5 have been obtained.)

6a. \_\_\_\_\_  
University Curriculum Committee^ Date

6b. \_\_\_\_\_  
Budget and Long-Range Planning Committee^ Date

FACULTY APPROVAL

7. \_\_\_\_\_  
Academic Senate Date

UNIVERSITY-LEVEL APPROVAL

8. \_\_\_\_\_  
Provost Date

9. \_\_\_\_\_  
Date to Chancellor's Office

+ Please contact the liaisons at the beginning of the process and allow sufficient time for the liaisons to prepare the resource implication report. Upon completion of the report liaisons will sign.  
\* May attach a memo on program impact on the unit and the ability of the unit to support it.  
^ Attach a memo summarizing the curricular and/or resource deliberations.

REC'D NOV 08 2013

CALIFORNIA STATE UNIVERSITY  
SAN MARCOS

**Pre-Health Professions Certificate**

1. Full and exact title of the Certificate program and level of the program (Certificate of Specialized vs. Advanced Study). Name and position of the person(s) submitting the proposed Certificate. Intended implementation date of the program.

Full and exact title of the Certificate program:  
**Pre-Health Professions Certificate Program**

Level:  
**Certificate of Specialized Study**

Name and position of the person(s) submitting the proposed Certificate.  
**Jose Mendoza, Professor and Chair of the Department of Chemistry and Biochemistry**  
**Tracey Brown, Professor and Chair of the Department of Biological Sciences**

Intended implementation date of the program.  
**Fall 2014**

2. List of the existing programs in the discipline(s) under which the new Certificate is to be offered.  
**None**
3. List of the existing program(s) that may be affected by the proposed Certificate.  
**None**
4. Purpose of the proposed Certificate, including specific academic objectives served, professional applications, potential student market, and a statement explaining the need for the Certificate in comparison to existing related majors, minors, and Graduate programs.
- **Purpose/Need for Certificate:** Many post-baccalaureates receive a degree (e.g., Kinesiology, Mathematics, Anthropology, Psychology, or English) and then later decide that they would like to enter a health profession. The purpose of the certificate program is to offer them a two-year program with a cohort structure that would help them acquire the necessary background to competitively apply to professional school, even without a science degree. Pre-Health courses are currently impacted at private universities, state universities, and community colleges throughout California. Post-baccalaureates interested in pursuing health professional degrees have a difficult time enrolling in the bottleneck courses. In addition, post-baccalaureates who attempt to fulfill the pre-health courses at CSUSM are required to go through Open University. However, priority is given to matriculated students. Non-matriculated post-baccalaureates have limited opportunity of attaining a seat in the classes. With the current procedures, post-baccalaureates are unintentionally blocked from the science courses. Bundling the prerequisite courses and offering them as a certificate program will provide additional access and in turn service our community.

- **Academic Objectives:** To prepare students to competitively meet the requirements for admissions into Health Professional degree programs, and prepare for the MCAT exam, which has recently been revised.
- **Potential Student Market:** The target audience for the program will be Postbac students pursuing Physical Therapy, Physician Assistant, Medical, Nursing, Dentistry, etc. degrees/certifications.

5. List of the courses, by catalog number, title, and units of credit, as well as total units to be required under the proposed Certificate.

The certificate requires a total of **51 units**:

- Biol 160 (4) Microbiology for Health Sciences
- Biol 210 (4) Introduction to Cellular and Molecular Biology
- Biol 211 (4) Introduction to Organismal and Population Biology
- Biol 321 (3) Human Physiology
- Chem 150 (4) General Chemistry & Chem 150L (1)
- Chem 250 (3) Quantitative Chemistry & Chem 250L (1)
- Chem 201 (3) Organic Chemistry & Chem 201L (2)
- Chem 202 (3) Organic Chemistry & Chem 202L (2)
- Chem 341 (3) General Biochemistry
- Math 132 (3) Survey of Calculus
- Math 242 (3) Intro to Statistics
- PHYS 101 (4) Introduction to Physics I
- PHYS 102 (4) Introduction to Physics II

The list of courses was created with consultation. First, we reviewed the pre-health professions certificate requirements at other CSUs (see the links below). The requirements of the pre-health professions certificate programs at other CSUs provided guidance for creating the list of the type of courses needed. Second, we reviewed the requirements for applying to several CA medical schools and matched them to our courses. This effort included several email and telephone exchanges with medical school admissions staff. Both of these approaches helped us learn, for example, that MATH 132 would satisfy the calculus requirement for most medical schools.

CSU East Bay	<a href="http://www.ce.csueastbay.edu/certificate/prehealth/index.shtml">http://www.ce.csueastbay.edu/certificate/prehealth/index.shtml</a>
CSU Stanislaus	<a href="http://www.extendeded.com/prehealth/">http://www.extendeded.com/prehealth/</a>
CSU Fullerton	<a href="http://www.csufextension.org/classes/HPPostback/index.asp">http://www.csufextension.org/classes/HPPostback/index.asp</a>
San Francisco State	<a href="http://www.sfsu.edu/bulletin/programs/prehea.htm#761917">http://www.sfsu.edu/bulletin/programs/prehea.htm#761917</a>
Cal State LA	<a href="http://www.calstatela.edu/academic/biol/certprehealth.php">http://www.calstatela.edu/academic/biol/certprehealth.php</a>

The course would be offered in the following sequence:

Example Schedule		
Fall 2014 (12 units)	Spring 2015 (11 units)	Summer 2015 (4 units)
Biol 210 (3 hr lab) Chem 150 & Chem 150L (3 hr lab) Math 132	Biol 211 (3 hr lab) Phys 101 (3 hr lab) Math 242	Chem 250 & Chem 250L (3 hr lab) (10 week course)
Fall 2015 (12 units)	Spring 2016 (12 units)	Summer 2016
Biol 321 Chem 201 & Chem 201L (6 hr lab) Phys 102 (3 hr lab)	Biol 160 (3 hr lab) Chem 202 & Chem 202L (6 hr lab) Chem 341	

### CATALOG DESCRIPTIONS

- BIOL 160 (4) Microbiology for Health Sciences.** Basic concepts of microbiology, including classification, metabolic activity and the effect of physical and chemical agents on microbial populations. Host parasite interactions, infectious agents, methods of transmission and control are also discussed. Three hours of lecture and three hours of laboratory. Course is designed for Nursing students.
- BIOL 210 (4) Introduction to Cellular and Molecular Biology.** The first of a two-semester core sequence that provides the student with basic knowledge in biology, including specific experimental techniques and familiarity with the scientific method. Emphasizes cellular structure and physiology, molecular evolution, classical and molecular genetics, and biochemistry. *May not be taken for credit by students who have received credit for BIOL 202. Three hours lecture and three hours laboratory. Co/Prerequisite: CHEM 150.*
- BIOL 211 (4) Introduction to Organismal and Population Biology.** The second of a two-semester core sequence that provides the student with basic knowledge in biology, including specific experimental techniques and familiarity with the scientific method. Emphasizes physiology, development, diversity of life, evolution, and ecology. May not be taken for credit by students who have received credit for BIOL 201. Three hours lecture and three hours laboratory. Prerequisite: BIOL 210 with grade of C (2.0) or better.
- BIOL 321 (3) Human Physiology.** A survey of body systems, how they function, and how they can malfunction leading to disease. Includes respiration, nutrition, waste removal, reproduction (including birth), embryonic development, muscular movement, and exercise.
- CHEM 150 (4) General Chemistry.** Introduction to the basic qualitative models and principles in chemistry. The areas covered include: basic atomic structure, the periodic table, covalent and ionic bonding, states of matter, intermolecular forces, energy, changes, chemical equilibria, acid-base and redox chemistry, stoichiometry, properties of gases, and chemical properties of the common elements. Intended for science majors. Three hours of lecture and one hour of discussion per week. Enrollment restricted to students with declared majors in: Biochemistry, Biological Sciences, Biotechnology, Chemistry, Kinesiology, Liberal Studies, Mathematics, and Physics. Prerequisite: Completion of the Entry Level Mathematics (ELM) requirement. Recommended: High School Chemistry and/or CHEM 101. Co/Prerequisite: CHEM 150L.

- **CHEM 150L (1) General Chemistry Lab.** Introduction to some of the basic laboratory techniques used in chemistry. The experiments are designed to complement the material covered in CHEM 150. Three hours of laboratory per week. Co/Prerequisite: CHEM 150.
  - **CHEM 201(3) Organic Chemistry.** First course of a sequence designed to introduce the student majoring in science to the properties of organic compounds. The entire sequence covers bonding, structure, stereochemistry, nomenclature, chemical and physical properties of each functional group, acid/base phenomena, reaction mechanisms and kinetics, organic synthesis, and an introduction to spectroscopic structure determination. Enrollment Requirement: CHEM 150 with a minimum grade of C (2.0). Co/Prerequisite: CHEM 201L.
  - **CHEM 201L (2) Organic Chemistry Laboratory.** The laboratory experiments are designed to illustrate the basic techniques of organic chemistry and to complement the lecture material covered in CHEM 201. Six hours of laboratory. Enrollment Requirement: CHEM 150 and CHEM 150L with a minimum grade of C (2.0). Co/Prerequisite: CHEM 201.
  - **CHEM 202 (3) Organic Chemistry.** Second course of a sequence designed to introduce the student majoring in science to the properties of organic compounds. The entire sequence covers bonding structure, stereochemistry, nomenclature, chemical and physical properties of each functional group, acid/base phenomena, reaction mechanisms and kinetics, organic synthesis, and an introduction to spectroscopic structure determination. Prerequisite: CHEM 201 and 201L with a minimum grade of C (2.0).
  - **CHEM 250 (3) Quantitative Chemistry.** Introduces quantitative approaches to chemical equilibria and kinetics. Fundamental principles of thermodynamics introduced in CHEM 150 are explored in greater depth. Topics include solubility, acids and bases, oxidation and reduction, and nuclear chemistry. Applications of these topics to practical chemical analysis are discussed. Co/Prerequisite: MATH 160. Enrollment Requirement: CHEM 150 and CHEM 150L with a minimum grade of C (2.0).
- Note: A C-2 form will be submitted in Fall 2013 to change the Co/prerequisite for CHEM 250 from "MATH 160" to "MATH 125 or enrollment in the Pre-Health Professions Certificate Program and Math 132."*
- **CHEM 250L (1) Advanced General Chemistry Laboratory.** A laboratory designed to support and illustrate chemical concepts studied in CHEM 250, as well as to introduce quantitative laboratory techniques and encourage analytical thinking. Corequisite: CHEM 250. Enrollment Requirement: CHEM 150 and CHEM 150L with a minimum grade of C (2.0).
  - **CHEM 341 (3) General Biochemistry.** A one-semester introduction to the concepts and language of biochemistry. Includes a description of the biochemistry of proteins, lipids, carbohydrates and nucleic acids, and an overview of cellular metabolism. Intended for science majors, but not for biochemistry and certain biological sciences majors (consult biological science department). May not be substituted for CHEM 351 and/or CHEM 352. Prerequisite: CHEM 201 with a minimum grade of C (2.0).
  - **MATH 132 (3) Survey of Calculus.** Basic calculus concepts with applications to business, economics, and the social sciences. Differential calculus for algebraic, exponential, and logarithmic functions; optimization, linearization, and other applications of derivatives; introduction to integral calculus. Includes use of graphing calculators. Enrollment Requirement: MATH 115 with a grade of C (2.0) or better.

- **MATH 242 (3) Introduction to Statistics.** Types of data, measures of central tendency and variation, visualizing data, counting principles, standard random variables, probability, conditional probability, standard discrete probability distributions, normal probability distribution, tests for normality, sampling distribution, central limit theorem, hypothesis tests for means and proportions, correlation, and regression. May include computer software such as Excel, Minitab, or courseware. Credit may not be counted toward the mathematics major. Enrollment restricted to students who have completed the Entry-Level Mathematics (ELM) requirement. Enrollment Requirement: MATH 115.
  - **PHYS 101 (4) Introduction to Physics I.** An overview of the principles of mechanics, thermodynamics, and waves. The areas covered include: observation and measurement, kinematics, dynamics, work and energy, impulse, and momentum, fluids, heat and temperature, oscillations, and waves in mechanical media. Three hours of lecture and three hours of laboratory. Enrollment Restriction: Completion of the Lower-Division General Education requirement in Mathematics/Quantitative Reasoning (B4). Enrollment Requirement: Completion of a course in trigonometry at the high school or university level.
  - **PHYS 102 (4) Introduction to Physics II.** An overview of the principles of electricity and magnetism, light and optics, and modern physics. The areas covered include: electric charge, electric fields, electric potential, DC circuits, magnetism, magnetic fields, geometrical and physical optics, and atomic and nuclear physics. Three hours of lecture and three hours of laboratory. Enrollment Requirement: PHYS 101.
6. Definition of the minimum level of competence to be demonstrated to earn the proposed Certificate, and a description of the means of assessing that competence (examination, practicum, field experience, etc.).
- Minimum level of competence to be demonstrated to earn the proposed Certificate will be **the completion of each course in the certificate with a grade of C (2.0) or higher.**
  - Pre-reqs and admission requirements for the program?  
**Bachelor degree with a GPA of at least 3.0 in the last 60 units attempted.**
7. Description of assessment strategies for waiver of lower division requirements (where applicable).
- No waivers will be provided for lower division requirements.
8. New courses to be developed. Include proposed catalog descriptions in the Certificate proposal. "C-forms" for these courses should accompany the proposed Certificate package for curricular review.
- No new courses will be developed. The certificate program is built on existing courses in the Departments of Biological Sciences, Chemistry, Mathematics, and Physics. The courses would be offered in the weekday evenings and possibly Saturday.



9. List of all present faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience, who would teach in the proposed aggregate of courses.

Dept	Last	First	Rank	Degree	Year
Biology	AboHebeish	Maggie	Lecturer-A (AY)	M.S.	2005
Biology	Burg	Michael	Lecturer-B (AY)	Ph.D.	1993
Biology	Hakanson	John	Lecturer-B (AY)	Ph.D.	1985
Biology	Escobar	Matthew	Assoc Professor	Ph.D.	2002
Biology	Hizer	Suzanne	Lecturer-B (AY)	Ed.D.	2010
Biology	Morrisette	Roger	Lecturer-B (AY)	Ph.D.	1997
Biology	Mustard	Robert	Lecturer-A (AY)	M.S.	2008
Biology	Nance-Sotelo	Courtney	Lecturer-L (AY)	B.S.	2006
Biology	Norris	Brian	Professor	Ph.D.	1989
Biology	Perkins-Johnston	Penny	Lecturer-B (AY)	PhD	1985
Biology	Pillsworth Jr	Thomas	Lecturer-B (AY)	Ph.D.	1984
Biology	Robertson	Lyndsey	Lecturer-A (AY)	M.S.	2004
Biology	Schulberg	Seth	Lecturer-L (AY)	B.S.	Unk
Biology	Berry	Jessica	Lecturer-A (AY)	M.S.	2012
Chemistry	Dickinson	Ann	Lecturer-C (AY)	Ph.D.	1990
Chemistry	Gonzales	Lenuta	Lecturer-B (AY)	Ph.D.	1997
Chemistry	Kolonko	Kenneth	Lecturer-B (AY)	Ph.D.	Unk
Chemistry	Mendoza	Jose	Professor	Ph.D.	1992
Chemistry	Jasien	Paul	Professor	Ph.D.	1984
Chemistry	Jayasinghe	Sajith	Assoc Professor	Ph.D.	1999
Chemistry	Ng	Wai Man	Assoc Professor	Ph.D.	1995
Chemistry	Schmidt	Michael	Professor	Ph.D.	1989
Chemistry	Trischman	Jackie	Professor	Ph.D.	1993
Mathematics	Lovelace	Joshua	Lecturer-A (AY)	M.S.	2009
Mathematics	Mercado	Serena	Lecturer-A (AY)	M.S.	2008
Mathematics	Scott	Kathleen	Lecturer-A (AY)	M.S.	1982
Mathematics	Hansen	Olaf	Professor	Ph.D.	1994
Mathematics	Woodward	W.	Lecturer-B (AY)	Ph.D.	1970
Mathematics	Sharif	Shahed	Asst Professor	Ph.D.	2006
Mathematics	Joshi	Badal	Asst Professor	Ph.D.	2009
Mathematics	Chien	David	Professor	Ph.D.	1991
Physics	De Leone	Charles	Professor	Ph.D.	1995
Physics	Bercovich Guelman	Clarisa	Lecturer-B (AY)	Ph.D.	1990
Physics	Bizzigotti	Tyson	Lecturer-L (AY)	B.S.	2006
Physics	Nourollahi	Hamid	Lecturer-A (AY)	M.S.	1993
Physics	Pinter	Jerald	Lecturer-A (AY)	M.S.	1991
Physics	Scott	Kathleen	Lecturer-A (AY)	M.S.	1982
Physics	Snyder	Perry	Lecturer-B (AY)	Ph.D.	1980
Physlcs	Tsui	Stephen	Assistant Professor	Ph.D.	2008

10. Instructional resources (faculty, space, equipment, library volumes, etc.) needed to implement and sustain the Certificate program.

All instructional resources needed to implement the Pre-Health Professions Certificate will be supported by the CSUSM campus and Extended Learning.

- A. The College of Science and Mathematics will maintain the curriculum and identify both the Faculty Coordinator and Pre-Health Certificate advisor.
- B. The Chairs of the departments in CSM will determine the instructors assigned to the certificate courses.
- C. The Chairs of the Departments of Biological Sciences and Chemistry will oversee the hiring of the instructional support technician.
- D. Extended Learning will provide the budget for student/lab materials, copying and duplication, promotion and advertising, instructional support technicians, instructors, release time for the Faculty Coordinator, salary for the Pre-Health Certificate advisor.
- E. Extended Learning will handle the course setup/registration, admissions tracking, website, marketing, student financial services, admission deadlines, FAQs, application checklist, transcript evaluation and GPA calculations. EL will also conduct the student information sessions. EL will assist in hiring the Pre-Health advisor.
- F. The Faculty Coordinator will have the following responsibilities regarding the certificate program: review completed applications and make admissions decisions; establish deadlines; develop, evaluate, and implement policies, such as GPA requirements. Respond to academic concerns or questions to students who have been admitted to the program, such as questions concerning withdrawal, academic probation, and academic standing.
- G. The Pre-health Advisor will have the following responsibilities:  
meet with prospective applicants; provide information to prospective applicants; respond to programmatic/administrative questions about the certificate program; advise applicants and students regarding possible paths to health careers.