CSU Northridge

CSU NORTHRIDGE PROPOSAL FOR MSTI-STEM CHALLENGE FUNDING: 2019-20

The California State University Northridge MSTI-STEM Challenge Project will expand the work of the CSUN MSTI project to increase mathematics and science credential production, diversity, and enrollment. We have outlined below areas of need based on the lessons learned from our project. We feel that we have accomplished the intent of MSTI by increasing the number of STEM secondary credentials but we know that with this challenge funding we can put in place even more programs and streamline the path to producing quality math and science teachers within the next few years. To achieve this goal, the CSUN MSTI-STEM Challenge Project is initiated new and/or expanded efforts as follows:

(I) *Recruitment of diverse students*

(A) Recruitment of undergraduate math majors by a *Mathematics Teacher-in-Residence*
(proposed by Dr. Kellie Evans, Mathematics)

In Fall 2015, the External Review Report of the Department of Mathematics included the stated. *"About one-third of the undergraduates majoring in mathematics pursue the option of a single-subject teaching credential. But relatively few faculty are committed to developing curriculum and teaching courses and providing advising for these students. The faculty who are working actively in this area have been very successful at obtaining large grants, such as a Noyce Scholarship program, that provide considerable benefits to students. But these faculty feel over-burdened and undersupported by their departmental colleagues. This deficiency is especially keen because CSUN is well-positioned to prepare much-needed, high-quality K-12 mathematics teachers for Los Angeles Unified School District, and also because preparing future teachers is an important mission of the CSU more broadly."*

We propose to support a practicing secondary mathematics teacher as a "CSUN Teacher-in-Residence" to work with the Department of Mathematics to (1) recruit, mentor, and retain prospective teachers majoring in Secondary Teaching, FYI-Math and JYI-Math; (2) consult and guest lecture in key classes for prospective teachers; (3) work with math faculty to create, enhance, and improve curricula; and (4) act as a role model for prospective teachers. The Teacher-in- Residence will also work with faculty from CSUN's Departments of Biology and Secondary Education on the CSUN Noyce II grant, which supports STEM majors and single subject Credential students preparing for secondary teaching careers.

(B) MSTI Scholars (Undergraduate STEM majors)
(proposed by Dr. Kellie Evans, Mathematics)

A key purpose of the California State University EduCorps Project is "*to significantly increase the number and diversity of students entering CSU's teacher preparation programs, especially in high-need areas such as mathematics, science…"*. Participant university teams have been encouraged by EduCorps to enhance recruitment efforts by engaging undergraduates in special activities related to STEM education so that these students start considering STEM-education as a career while they are still undergraduates.

Towards this end, we plan to develop a cadre of CSUN MSTI Scholars that will have access to special opportunities. For example, MSTI funds may pay for MSTI Scholars to attend STEM-Education conferences such as the California Math Conference, CSU-Mathematics Teacher Education Partnership (CSU-MTEP), theMTEP Annual Conference, California Science Teachers Association (CSTA) annual conference, and the annual California STEAM conference. In addition, MSTI Scholars would be invited to participate in weekly gatherings with STEM Faculty and the Mathematics Teacher-in-Residence.

MSTI Scholars will assist in recruiting new students by visiting lower division STEM courses (including those in Engineering and Computer Science) to invite students to information sessions or other recruitment events. In addition, they may support the CSU Graduation Initiative 2025 by serving as tutors or peer learning group facilitators.

(C) MSTI STEM Teaching Assistants

(proposed by Dr. Brian Foley)

Polytechnic High School, a local, "high-needs" and diverse public high school offers a Summer STEM workshop for incoming 9th graders. We propose hiring MSTI Scholars to serve as teaching assistants so that they can work with experienced teachers on innovative curricula. MSTI teaching assistants will not only receive an income, but will satisfy early field experience requirements for entrance to the CSUN credential program. In addition, MSTI TAs will learn how to inspire their secondary school students to consider STEM and STEM-education careers. This project has been successful in the past and we would like to expand on it and possibly use this model with another high need public high school in our area. Again this would provide the opportunity for the early field experiences that many of our students have a hard time achieving due to lack of programs and guidance. These experiences would expedite the application process for our students who are choosing to go into secondary teaching.

(II) *Creation of new pathways to earn mathematics and/or science authorizations/credentials and Supplementary Authorization in Computer Science*

(A) Development of Waiver Programs in Biology, Chemistry, Geoscience and Physics

(proposed by Dr. Virginia Vandergon, Biology)

At CSUN, subject matter waiver programs exist in mathematics, English, art, music, history, Spanish, and physical education. During the past two years, one third (34%) of all credential candidates in these fields met the subject matter requirements for admission to the credential program through waiver programs. Unfortunately, there have been no subject matter waiver programs in any of the sciences since 2002. Prior to 2002, undergraduate majors in biology, chemistry, geoscience, and physics could pursue a program of study that would waive the necessity to pass the subject exam required for admission to credential programs (CSET). Many undergraduates are enrolled in programs of study that would directly prepare them for a career in science teaching and with their degrees they clearly have the content knowledge that California Department of Education is looking for in qualified teachers.. By developing waiver programs in each of the four science credential fields, we will provide qualified undergraduates with clear pathways to entry into science teaching. Undergraduates in the College of Science and Mathematics will not only see pathways to careers in science education, but will also receive counseling should they decide to

pursue such pathways. Once waiver programs have been established in the sciences, we plan to develop four-year integrated (FYI) and Junior-year integrated (JYI) program options so students can work toward careers in science teaching more expeditiously.

(B) Authorizations in Computer Science

(proposed by Dr. Brian Foley)

In anticipation that the state will create a Computer Science Credential in the next 2-4 years, we have created a Computer Science methods course (SED 525CS to be proposed this fall). Once this course is approved we would like to encourage current and prospective computer science and math teachers (including interested undergraduates) to take the class. Once this course is offered, we will subsidize fees for students to encourage greater participation and help further develop interest in regular credentials and supplemental authorizations in computer science.

(III) *Development or revision of teacher education curricula to support an emphasis on STEM content (to enhance/improve existing curricula and/or to support newly developed pathways/programs).*

(A) Enhanced / Improved STEM Education Curricula

CSUN has a well-developed mathematics and science education credential and master's degree programs, as well as a master's program in educational technology. The professors in these programs are continually revising the curricula to incorporate advances in educational technology and to reflect advances in STEM as well as curricular and pedagogical innovations as expressed by the Common Core Curricular Standards and the Next Generation Science Standards. We will continue to enhance and improve existing curricula to support existing and newly developed pathways and programs. There will be no expense to MSTI since this is an ongoing commitment of our faculty.

(B) Research experiences for pre-service teachers

(proposed by the Chancellor's Office)

Pre-service teachers who have engaged in STEM research experiences are better equipped to inspire their future students to pursue careers in STEM and STEM education. To provide teachers with such opportunities, we propose funding a limited number of pre-service teachers to participate in the CSU STEM Teacher and Researcher (STAR) Summer Internships with federal research laboratories (starteacherresearcher.org).

(C) Development of a CSET-Preparation Course in Chemistry

(*proposed by Dr. Dorothy Nguyen-Graff, Chemistry; Dr. Norman Herr, Science Education)*

There is a dramatic shortage in the number of credentialed chemistry teachers. We plan to address this need by developing a 40-hour CSET subtest-II preparation course in chemistry. We plan to develop and deliver the course both in person and online by the Summer of 2020. We would then offer this course once a year modeling our success with Physics subtest-II workshops.

(IV) Assistance to enter and complete STEM credential programs

(A) CSET- Preparation / Credential Program - Introductory Meeting

(proposed by Dr. Brian Foley)

Students who are just starting to think about teaching have a lot of questions about the requirements and their career prospects. Currently the first meeting many students attend is a CSET preparation workshop. A lengthy course that does not always provide the big picture that students are looking for. We propose offering periodic CSET-Preparation Overview sessions during which individuals can learn about the CSET exam structure and how to prepare for admission to the credential program as well as general information about what it is like to get a credential and be a STEM teacher. From these sessions, we can recruit individuals into our existing in-person CSET preparation courses in FLM, Math, FLGS, and Physics (and Chemistry in 2020 (see above)). Individuals will also be made aware of online preparation options (we have developed a 40-hour online physics CSET prep course, and hope to develop additional online options) and how to apply for grants, scholarships, and federal loan forgiveness programs including TEACH grants and NSF Noyce Scholarships.

(B) Subsidizing the cost of applying to the credential program for those completing the waiver (proposed by Dr. Kellie Evans)

We currently offer financial incentives to assist those who complete the CSET-preparation courses to help cover the costs of applying to the credential program (exam fees, fingerprinting, application fees, etc.). We plan to subsidize the credential program application costs for those who complete our waiver programs.

MSTI-STEM Challenge Budget Narrative for 2019-2020

1.0 Personnel Salaries

1.3 MSTI funds in the amount of **$10,000** will be used as Student Assistant salaries to support the Campus Plan Components.

4.0 Consultants and Honoria

4.1 MSTI funds in the amount of **$9,500** for a Teacher-in-Residence to recruit, mentor, and retain prospective teachers majoring in Secondary Teaching and collaborate with Math Faculty to create, enhance, and improve curricula.

4.2 MSTI funds in the amount of **$8,100** will be used as replacement salary for Math Faculty to develop curricula and advise students in the Math Department pursuing the Math credential.

5.0 Travel (In-state)

5.2 MSTI funds in the amount of **$8,000** will be used for travel for undergraduate Math/Science/Engineering Scholars to attend the CMC, CSTA, and STEAM conferences, Fall 2019 and Spring 2020.

7.0 Stipends and Scholarships

7.1 MSTI funds in the amount of **$20,000** will be used for Math and Science tutors to gain clinical experience in teaching through tutoring roles in high schools.

7.2 MSTI funds in the amount of **$3,000** will be used for the fees students incur applying for admission into the CSUN Credential program.

7.3 MSTI funds in the amount of **$500** will be used for books and materials for participants in Campus Plan Components.

8.0 Other Expenses

8.1 MSTI funds in the amount of **$11,600** will be used for CSET Test Preparation and to reimburse the costs incurred by students for CSET exams.

8.3 MSTI funds in the amount of **$29,300** will be used as replacement salary for faculty to create and coordinate the Subject Matter Waiver Program in General Science, Biology, Chemistry, GeoScience, and Physics.

California State University		Campus: Northridge	
MSTI-STEM Challenge			
Fund/Account for Transfer: 48501 / 660B01			
Year	Item		MSTI-STEM Challenge 2019-20
2019-20 Budget for MSTI-STEM Challenge Activities	**1.0**	**Personnel - Salaries**	
	1.1	Faculty	$ -
	1.2	Staff	$ -
	1.3	Students	$ 10,000.00
		Sub-Total	$ 10,000.00
	2.0	**Personnel - Benefits**	
	2.1	Faculty	
	2.2	Staff	$ -
	2.3	Students	$ -
		Sub-Total	$ -
	3.0	**Supplies and Expenses**	
	3.1	Printing and Duplication	$ -
	3.2	Instructional materials	$ -
	3.3	Office supplies	$ -
		Sub-Total	$ -
	4.0	**Consultants and Honaria**	
	4.1	K-12 Teachers	$ 9,500.00
	4.2	Other	$ 8,100.00
		Sub-Total	$ 17,600.00
	5.0	**Travel (In-state)**	
	5.1	Recruitment/Outreach	$ -
	5.2	Professional Development	$ 8,000.00
	5.3	Other	$ -
		Sub-Total	$ 8,000.00
	6.0	**Meeting Expenses**	
	6.1	Facilities	
	6.2	Refreshments	
	6.3	Other	
		Sub-Total	$ -
	7.0	**Stipends and Scholarships**	
	7.1	Stipends	$ 20,000.00
	7.2	Student Fees	$ 3,000.00
	7.3	Books and Materials	$ 500.00
	7.4	Scholarships	$ -
		Sub-Total	$ 23,500.00
	8.0	**Other Expenses**	
	8.1	CSET Test Preparation	$ 11,600.00
	8.2	Web/Social Media	$ -
	8.3	Other/Subject Matter Waiver	$ 29,300.00
		Sub-Total	$ 40,900.00
		Grand Total	$ 100,000.00
	Note: Follow the guidelines listed on the MSTI application in order to complete the form and to write the budget justification.		