Northern New Mexico College

Española, New Mexico

New Graduate Program Approval Request

Master of Arts in Teaching and Learning
and
Master of Arts in Teaching Mathematics and Science

Submitted by:

College of Education
Northern New Mexico College
921 Paseo de Oñate
Española, New Mexico 87532

Principal Contact:
Andres C. Salazar, PhD
Associate Provost, Research & Graduate Studies

Proposal for approval of two new graduate degree programs

Master of Arts in Teaching and Learning
and
Master of Arts in Teaching Mathematics and Science

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This proposal has been developed based on the New Mexico Department of Higher Education provisions of 5 NMAC 5.2 that apply to new graduate programs proposed for implementation by a constitutional institution of higher education in the State of New Mexico. The organization of this document as outlined in the table of contents below corresponds to 5 NMAC 5.2.9 –

A. Purpose of the Program and Mission of the Proposing Institution.
The proposed program must have a clear purpose that is consistent with the mission of the proposing institution.

(1) Primary Purpose

The mission of NNMC is to provide accessible, affordable, community-based quality learning opportunities that meet the educational, employment, and enrichment needs of our culturally diverse region. The purpose of the proposed programs is to provide access for educators in our region to graduate degrees in Education that will positively impact student achievement in our schools. The purpose of this proposal is to obtain approval to initiate a Master of Arts in Teaching that will contain two Masters programs: a Master of Arts in Teaching and Learning (MATL) and a Master of Arts in Teaching Mathematics and Science (MATMS). Both programs will be situated at the Northern New Mexico College (NNMC) main campus in Española, New Mexico. The program will increase the number and diversity of Master's level educators in Teaching and Learning and in Teaching Mathematics and Science at the K-12 level. The program will benefit New Mexico in general and Northern New Mexico specifically. The two Masters programs are focused on the current need for knowledgeable teachers in school leadership positions and are a direct response to New Mexico's growing shortage of mathematics and science teachers, and to the New Mexico Public Education Department's requirement of a Master's degree to attain a Level III certification. The Master of Arts in Teaching Mathematics and Science, in particular, is a direct response to the established *NM Project 2012* goal "improv[ing] math and science content study in the pre-service education of K-12 teachers to prepare them well to teach robust math and science curricula while at the same time increasing the supply of those teachers" (New Mexico Public Education Department, 2008).

Master of Arts in Teaching and Learning

The principal purpose of the Northern New Mexico College Master of Arts in Teaching and Learning (MATL) is to build in classroom teachers a theoretical and practical knowledge of the relationships among curriculum, instruction, assessment and learning technologies and to serve as a link between current cognitive and neurological research and education. The MATL would be available to classroom teachers and others who are interested in gaining pedagogical and content knowledge needed to inspire student success. Graduates of MATL could serve as lead teachers in school unit professional development communities interested in increasing student achievement and learning.

Master of Arts in Teaching Mathematics and Science

The principal purpose of the Northern New Mexico College Master of Arts in Teaching Mathematics and Science (MATMS) is to develop in classroom teachers a deep understanding of pedagogical-content knowledge in mathematics, science, learning technologies and current cognitive and neurological research as they relate to their application and integration in today's K-12 classroom. Specifically, it is the intent of the program to begin a scholarly journey for teachers that will lead them to value mathematical and scientific thinking and the effective teaching of these two academic areas to young minds. The goal of the program is to improve student achievement and

learning by improving the quality and delivery of the teaching of mathematics and science. The MATMS would be available to classroom teachers and others who are interested in gaining pedagogical-content knowledge needed to inspire student achievement and learning in mathematics and science.

(2) Program Consistency with the Role and Scope of Northern New Mexico College

The proposed degree programs are fully consistent with the current Mission Statement and the Proposed Change of Mission of Northern New Mexico College, namely: "Northern New Mexico College provides accessible, affordable, community-based quality learning opportunities that meet the educational, employment, and enrichment needs of our culturally diverse region.

(3) Institutional Priority for the Proposed Program

NNMC was founded in 1909 by an act of the State's Constitution as a "normal" school for the education of the Spanish-American community of Northern New Mexico. Hence, education has been and continues to be the signature program of the school. NNMC gained authorization from the NM Legislature to award Bachelor's degrees in Education (and in five other areas) only four years ago. Seventeen students have completed the program since its initiation. However, much like many other disciplines, a Master's level education is becoming a necessary requirement for those who aspire to greater success in the profession of educational instruction.

With the tradition of a ranching and farming economy spanning several centuries, Northern New Mexico continues to be a geographic area of low per capita income with a high proportion of under-educated citizens. Because education is a major gateway to higher paying jobs, we believe that Baccalaureate and Master's Degree graduates in Education will in turn improve the economic and community development of Northern New Mexico. On a more personal and career enhancement basis, teachers in northern New Mexico will have the opportunity to obtain a Master's Degree and thus advance in the state's three-tiered licensure system.

(4) Curriculum & Degree Requirements

The Master of Arts in Teaching and Learning format is initially designed as an 8 semester, thirty-six credit hour program. The program begins the summer (or fall) of 2010 with a three-week intensive experience during which the students will earn the first six credits toward the MATL degree. Summer semester 2011 will be expanded to a four-week session consisting of three courses. Fall and spring semester courses are limited to one course per semester requiring at least two face-to-face meetings with the remainder of the courses offered primarily online.

The Master of Arts in Teaching Mathematics and Science format initially is an 8 semester, thirty-six credit hour program. The program would begin in the summer of 2010 with a three-week intensive experience during which the students will earn the first

six credits toward the MATMS degree. Summer semester 2011 will be expanded to a four-week session consisting of three courses. Fall and spring semester courses are limited to one course per semester requiring at least two face-to-face meetings with the remainder of the courses offered primarily online.

All mathematics and science courses are based on the New Mexico Mathematics and Science Standards with special emphasis on the Mathematics Process Standards in the mathematics courses and the scientific method and inquiry-based method emphasized in the science courses. In addition, all courses attempt to define and instill in the pre-service teacher the New Mexico entry-level math and science content competencies.

The proposed MATL and MATSM will be housed in the new NNMC College of Education Building, and would employ faculty in the College of Education and the Department of Mathematics and Sciences as primary instructors for the courses. The culminating scholarly experience of both programs is a formal Action Research Project that will be presented and defended before a committee of faculty prior to program completion.

B. Justification for the Program

The proposed program must meet one or more specified needs within the state or region; must not duplicate existing programs unnecessarily or inappropriately; and, to the extent feasible and appropriate, should benefit from cooperative arrangements with other institutions.

(1) Need

The proposed program must meet one or more specified needs with the state or region. Clear and convincing evidence must be provided of the reality and extent of such need.

The need for a viable and sustained Master of Arts in Education program situated in Northern New Mexico, specifically at NNMC, is evident in light of the critical need for quality K-12 teachers in the areas of math and science--a need identified by a national assessment of student mathematical skills and knowledge. Other reports of national studies on the status of education commissioned by national education councils mention the lack of qualified math and science teachers at the elementary level. Such need was also cited by a committee convened by the Office of the NNMC President when investigating the mediocre performance of New Mexico students during the previous 4 years on the mathematics subtest of the New Mexico Standard-Based Assessment (NMSBA).

The State of the State of New Mexico's elementary programs reports a low number in the "production of high school math and science teachers [namely] 26 of each" (Project 2012 Executive Summary, 2008). Currently, the New Mexico high school graduation requirement for math and science is 3 mathematics courses and 3 science courses. "By 2009 all students who enter high school will be required to pass Algebra II or its equivalent to graduate" (NMPED, Project 2012 Executive Summary, 2008). If one couples the above two facts--the low math and science teacher production with the

increased high school math graduation requirement-- it is evident that many New Mexico children may be taught by teachers who are less then qualified to be teaching math and science at a profound level of understanding.

The New Mexico Mathematics and Science Content Standards and the NMSBA have been highly praised for their relevance and rigor respectively. However, according to the results of the National Assessment of Educational Progress (NAEP) and the NMSBA, student scores are not yet at the acceptable standards set by either metric. On the NAEP, "New Mexico's average [4th grade] score (228) in 2007 was lower than that of the nation's public schools (239)," and "of the 52 states and other jurisdictions that participated in the 2007 fourth-grade assessment, students' average scale score in New Mexico was higher than that in 1 jurisdiction… and lower than those in 46 jurisdictions" (National Center for Education Statistics, 2007). The NAEP 8th grade scores show an identical pattern. "New Mexico's average [8th grade] score (268) in 2007 was lower than that of the nation's public schools (280)," and "of all states and other jurisdictions that participated in the 2007 eighth-grade assessment, students' average scale score in New Mexico was higher than those in 2 jurisdictions…and lower than those in 46 jurisdictions."

The encouraging news in the midst of this less than mediocre performance is that since the introduction of the New Mexico Mathematics Standards in 2004, "The percentage of [4th grade] students in New Mexico who performed at or above the NAEP *Proficient* level was 24 percent in 2007. This percentage was greater than that in 2005 (19 percent) which was greater than that in 1992 (11 Percent)." Again, the percentage of 8th grade students in New Mexico who performed at or above the NAEP *Proficient* level shows the same pattern as the 4th grade students. The percentage of 8th grade "students who performed at a *Proficient* level was 17 percent in 2007. This percentage was greater than that in 2005 (14 percent) which was greater than that in 1990 (10 percent)." Additional improvement is evident for New Mexico 8th grade students ranking *Proficient* or above on the mathematics subtests of the NMSBA 2008 (37 percent). The 8th grade students ranking *Proficient* or above on the science subtests of the NMSBA 2008 follows the same pattern (26 percent). However, "In 2008, math achievement scores dipped overall in 4th grade." (2008 Adequate Yearly Progress and Achievement Gap Announcement, 2008)

According to several education researchers, part of the problem may rest in the preservice preparation of teachers by postsecondary institutions "where meaning was not a primary goal of learning, where rote learning of algorithms and procedures was not only acceptable but mandatory" (Armstrong & Bezuk, 1995, p. 87). Masingila (1998) follows with, "I find that many prospective teachers do not conceptually understand or know division by fractions even though they have already completed at least a bachelor's degree in mathematics" (p. 3). Hence, the trouble spot in the elementary mathematics curriculum is not just an elementary curricular problem that eventually surfaces in the upper grades, or the unmotivated, recalcitrant student, but is also a systemic problem from K through 16. In fact, the National Council on Teacher Quality (NCTQ) study, "No Common Denominator: The Preparation of Elementary Teachers in Mathematics by America's Education Schools," that looked into the mathematics preparation of

America's elementary teachers released in June 2008 is critical of the math preparation received by teachers in our nation's colleges and universities. Out of 77 elementary education programs studied only 10 programs scored adequately on the three criteria set by the NCTQ: relevance, the degree to which the course offerings are aligned to what the preservice teacher will be teaching in the classroom; breadth, the degree to which the course offerings cover "essential mathematics topics" and depth, the degree to which the course offerings provide the preservice teacher a profound understanding of the fundamentals of mathematics. The University of New Mexico elementary program is the only New Mexico elementary education program in the 10 programs that were scored as adequate with the stipulation: "Although these schools pass for providing the right content, they still fall short on mathematics methods coursework. They do not require a full course dedicated solely to elementary mathematics methods." Again, New Mexico is without a mathematics teacher preparation program that speaks to the relevance, breadth and depth of mathematics content and pedagogy that is required to prepare our students to compete in a global economy. More importantly, New Mexico is without a teacher preparation program that assists prospective teachers in gaining a profound understanding of the fundamentals of mathematics, which is needed to create students who understand mathematics and are able to think mathematically. The New Mexico Project 2012 (NMPED, Executive Summary, 2008) realizes this same need through its first two goals:

- Provide much better preparation in math and science content for newly-graduating teachers.
- Increase significantly the number of math and science teachers in our high schools.

(2) Duplication

The proposed program must not duplicate existing programs unnecessarily or inappropriately. A proposal for a program similar to one (or more) that already exist within the state must present clear and convincing evidence that need for the program cannot be met by the existing program(s).

Today, because of ongoing research utilizing new technologies which peer into the functioning of the brain and its many sub-structures and the resultant applications to teaching and learning, informed teacher preparation institutions can readily take advantage of the educational yields of the new biological age we have just entered. Due to this synchronicity between the proposed Master of Arts in Teaching programs and the new age of brain research, the MAT can readily include in its two programs of study the most recent research-based pedagogical knowledge as to how the brain functions. The MAT program is, therefore, without precedence. In other words, the two MAT programs are not slowed by the friction and inertia of prior thinking about how to prepare teachers to teach.

The proposed NNMC Master of Arts in Teaching and Learning and the Master of Arts in Teaching Mathematics and Science are distinctive in several ways. A strong neuroscience strand is threaded through the entire length of both programs. This conscious design is an attempt to bridge the gap between the most recent neuroscience research and its application to education. The mindful design of weaving the brain research thread through the entire fabric of both programs is one of understanding the cognitive change

that occurs in both the teacher and the student as they commit to learning. It is a deliberate attempt to get the teacher to think about thinking. We believe that *thinking teachers grow thinking students*. That is, formal thinking (e.g., mathematical and scientific thinking) can only be taught in a systematic, deliberate context with a knowledgeable teacher.

The Master of Arts in Teaching Mathematics and Science stands alone not only because of the brain research strand as it applies to mathematical and scientific thinking but also because of its 3/2/3 framework. That is, three mathematics courses that address the most current math content needs of both teachers and their future students, as shown by both state and national student achievement scores; followed by two statistics and data analysis courses that are aligned to classroom teacher needs for data analysis and decision-making; and three science content courses that focus on inquiry approaches to teaching accurate scientific concepts and the development of scientific thinking. All mathematics, statistics and data, and science courses add to the teachers' content-knowledge and the mindful teaching of mathematics and science.

(3) Inter-Institutional Collaboration and CooperationTo the extent feasible and appropriate, the proposed program should establish collaborative relationships with other programs within New Mexico, so that state investments can be shared and students can benefit from expanded opportunities across institutional boundaries.

The proposed NNMC Master of Arts in Teaching program, which contains both the MATL and the MATMS, is the product of a natural evolutionary process. The program stems from NNMC's undergraduate degree in elementary education initiated in 2005, and contributes to NNMC College of Education's mission for "teachers in northern New Mexico …to obtain a Master's Degree and thus advance in the state's three-tiered licensure system."

The proposed program will admit graduate students enrolled at other New Mexico colleges and universities as part of their program of study according to established guidelines for approval of courses and transfer of credits from other New Mexico higher education institutions.

Also, the proposed program will create partnerships with local K-12 education agencies and professional developers (e.g., Los Alamos National Laboratory Math and Science Academy and the Northern New Mexico Network for Rural Education) to deliver quality professional development services to practicing teachers. The core belief of the program is that teaching and learning are a reciprocating system. Learning, then, is socially mediated through the dialogue and activities of teaching and of being taught. Therefore, it is imperative that our MAT faculty formally interact with existing K-12 teachers and collaborate and cooperate with existing regional professional developers. This arrangement will inform all sides of the partnership as to the needs, strengths and visions of all involved, thus prompting the redesign of the MAT program curriculum as indicated by its students, faculty and other collaborators.

In addition to inter-institutional collaboration and cooperation, the NNMC Master of Arts in Teaching program is committed to intra-institutional collaboration and cooperation between the NNMC College of Education and its Mathematics and Science Departments as recommended by the National Council on Teacher Quality (NCTQ). Standard 5 of the NCTQ's report, "No Common Denominator: The Preparation of Elementary Teachers in Mathematics by America's Education Schools" reads:

> The job of teaching aspiring elementary teachers mathematics content should be within the purview of mathematics departments. Careful attention must be paid to the selection of instructors with adequate professional qualifications in mathematics who appreciate the tremendous responsibility inherent in training the next generation of teachers and who understand the need to connect the mathematics topics to elementary classroom instruction (Executive Summary, June, 2008).

A glance at the Program of Study for the Master of Arts in Teaching Mathematics and Science shows that both the mathematics and the science department faculties will teach the mathematics and science courses, respectively.

C. Clientele and Projected Enrollment

The proposal must clearly describe the population of students who will be recruited into the proposed program and must include a detailed projection of enrollment and credit hours anticipated during the first five years.

(1) Clientele

Three years ago NNMC instituted a four-year Baccalaureate degree program in elementary education, and converted the Department of Education into the College of Education (COE). The COE also oversees the Alternative Licensure Program (ALP), which has been in place for nine years. In 2007, NNMC graduated its first professional elementary teacher. In 2008, NNMC added four more teachers to the pool of New Mexico professional elementary teachers. Currently, there are 80 prospective teachers in the NNMC elementary teacher education pipeline and 14 ALP candidates are expected to graduate in 2009. It is incumbent upon NNMC to continue supporting these two groups of teachers and others following them to attain Level III status, which requires a master's degree or comparable certification—a requisite of the New Mexico Licensure Department 5 years after the initial teaching year.

In addition, there are 27 teaching assistants from area school districts enrolled in the NNMC Bachelor of Arts program. This is an unintended consequence of the proximity of the NNMC Bachelor of Arts program to area schools. This unintended consequence is an excellent example of the critical importance of a Master's program being located so close to its clientele at NNMC. Just the proximity of the program will draw those practicing teachers who for reasons of distance and finance have not attempted to enroll in a Master of Arts in Teaching program elsewhere. Currently, there are approximately 200 Level II teachers in the NNMC service area according to the New Mexico Public Education Department.

Additionally, it is the intent of the program to forge partnerships with service area school districts to provide quality professional development for practicing teachers based on sound educational research. The program's core belief is that the most important influence on student learning in the classroom is the teacher, be it at the K-12 level or at the higher education level. An important goal of the NNMC Master of Arts in Teaching is to build the faculty's professional capacity and understanding of K-12 teacher and student needs through a reciprocating system that encourages a continuous and embedded structure requiring collaboration between K-12 school districts and higher education institutions. The above stated objective would be a direct implementation of the PED's New Mexico Project 2012, Chapter 2 Recommendation 2.1 (a) to enact "a statute to require annual professional development for all teachers of math or science to be phased-in over a five-year period;" and Recommendation 2.1(b) to "require that districts partnering with professional development providers include the time for their teachers to accommodate professional development as part of their regular work schedule."

(a) Application Deadlines

At the startup of the program, only Summer Session (2010), the deadline for full consideration for admission will be April 1, 2010. Notification of acceptance will be sent by the NNMC College of Education by May 1 to those applicants who meet the initial deadline.
Thereafter, acceptance of applications for consideration will be contingent upon space available with a final deadline of May 1.

(b) Admission Requirements

The Graduate Studies Committee of the College of Education will be in charge of the admission process. The general requirements for the Master's degree are set forth below:

- Possession of an undergraduate degree in a related field from an accredited university. Most students will enter with a major degree in education.
- An undergraduate grade point average of 3.0 or higher on a 4.0 scale.
- Applicants should have a working knowledge of:
    - K12 school systems
    - Curriculum and Instruction
    - Assessment and Evaluation
- A 1-2 page statement from the candidate addressing individual professional and personal goals with career interests and a description of any past and current professional experience in the field of education (K-12 or higher).
- A 2-3 page résumé summarizing the candidate's background.
- Three letters of recommendation sent directly by former professors or by persons who know the applicant professionally, including a recommendation from the candidate's employer.

Exceptions to any program admission criteria will be considered on an individual basis and are at the discretion of the Graduate Studies Committee which will send its recommendation to the Dean of the College of Education.

(2) Projected Enrollment

It is assumed that nearly all students enrolled in the MAT program will be part-time students because of their employment in schools in the NNMC service area. The projected student enrollment in the proposed program is given in Table 1. The steady projection of numbers of students is due to the cohort aspect of the proposed graduate program.

Currently the student enrollment at NNMC is over 70% Hispanic and 9% Native American with women forming about 60% of the student body. Similar percentages are expected in the proposed graduate program, at least to start, with the percentage changing over time as more out-of-area students (including foreign students) enroll in the program. These percentages will also change as more graduate courses are offered online.

Table 1 Projected Student Enrollment

Year	1	2	3	4	5
New Students, Part-time	15	15	15	15	15
Returning Students, Part-time	0	15	30	30	30
New Students Full-time	0	0	0	0	0
Returning Students, Full-time	0	0	0	0	0
Total Headcount – 1st Semester	15	30	45	45	45
Graduates – Full-time	0	0	0	0	0
Graduates - Part-time	0	0	15	15	15
Graduates - Total	0	0	15	30	45

It is assumed that the cohorts of 15 part-time students will take 12 credit-hours per year. This translates into the student-credit-hours estimated below in Table 2 with the I&G revenue of $670.64 (Tier 1) for each graduate SCH unit.

Expected Student-Credit-Hours

Table 2 Projected Student Credit Hours (SCH)

Year	1	2	3	4	5
Total Part-Time Students	15	30	45	45	45
Total SCH Part-time	180	360	540	540	540
Total SCH	180	360	540	540	540
Total I&G at Tier 1 Formula	$120,715	$241,430	$362,145	$362,145	$362,145

Market analysis: size of the potentially interested group of students

In 2000, the Los Alamos National Laboratory's Northern New Mexico Math and Science Academy (MSA) began professional development programs in math and science for elementary teachers in K-12 school districts in Chama, Española, Mora, Pojoaque and Taos. It was obvious from classroom observation and student achievement scores in mathematics and science that teachers were in need of a more profound understanding of these subjects. MSA came to believe that continued and embedded teacher professional development in math and science education were essential if teachers were to deliver quality instruction to their students in these areas. In 2004, a partnership between MSA and New Mexico State University's College of Education was fashioned to deliver a blended Master of Arts in Teaching Mathematics and Science through the MSA Summer Institutes and online. To date, 46 teachers from Northern New Mexico school districts have received this degree: twenty-six in 2007 and nineteen in 2008. Twelve teachers are scheduled to complete the program in 2009 followed by four more in 2010. One reason for the decline in the number of teachers enrolling in the MSA/NMSU program is the small number of teachers in rural school districts in northern New Mexico. Another reason is financial--the cost of tuition for the 2007 and 2008 MSA/NMSU graduates was $4000, whereas the tuition cost for the 2009 and 2010 MAT candidates is $8000. This is an expense that many teachers cannot afford.

The small number of elementary teachers in districts like Chama and Mora in Northern New Mexico causes teacher enrollment in the program provided by MSA and NMSU to rapidly reach a saturation point. However, the need continues in the larger school districts such as Española and Pojoaque. In addition, other Northern New Mexico School Districts (Mesa Vista, Questa, and Peñasco to name a few) wish to enroll in the MSA/NMSU program but because of staff and budgetary constraints, MSA has been unable to honor these districts' requests for partnering with MSA. In addition, MSA is continually contacted by NNMC service area charter schools wishing to join the three-year professional development program. There remains substantial and continuing need for quality teacher development in Northern New Mexico, particularly in the areas of math and science.

The NNMC Master of Arts in Teaching degrees will provide high quality learning opportunities suitable for:

- Practicing teachers, principals, curriculum developers, mentors and mathematics science specialists and coaches interested in understanding the "why" of mathematics and science.
- Students whose undergraduate majors are in Education, and who want to prepare for a career in education as teachers and educational leaders, and
- Educators who are interested in the effectiveness of instructional practices and materials.

D. Institutional Readiness for the Program

The institution should have nearly all the resources needed to initiate the program. The proposal should include a clear statement of the extent to which the institution is ready to initiate the program, citing the remaining needs and recognizing each of those needs in the cost analysis developed.

NNMC is in the process of creating the infrastructure required to support the Master of Arts in Teaching and Learning and the Master of Arts in Teaching Mathematics and Science. There has been progress in the area of refitting existing structures to make room for graduate school structures. These will be in place when the program begins.

(1) Teaching Faculty

The faculty of NNMC College of Education is a diverse group that is committed to the development and implementation of a quality education program that will positively impact the future of school children in the region. One of the most significant qualifications of the faculty centers on the diversity of experience and expertise each one brings to the COE. Our faculty is comprised of members of the educational community who are developers of respected professional development programs; recognized experts in specific areas such as reading, science, mathematics, technology or educational psychology; members of the New Mexico State Public Education Department; professors who have been tenured at other colleges of education; and collaborators on best practices in the classroom.

Table 3. Faculty Qualification Summary

Faculty Member Name Faculty Rank	Highest Degree, Field, & University	Assignment: Indicate role of the faculty member	Tenure Track	Scholarship, Leadership in Professional Associations, and Service: List up to 3 major contributions in the past 3 years	Teaching or other professional experience in P-12 schools
Walter Archuleta Assistant Professor	Ph.D., Spanish Linguistics University of New Mexico	Director of the TESOL and BILINGUAL Associate Professor of Bilingual Education	Yes	Curriculum Committee Member; Standards Committee Member; NNMC Strategic Planning Participant (2008) NMABE Conference, La Cosecha Conference Current NM License 7-12, Spanish, Bilingual Ed, TESOL Adjunct Faculty New Mexico Highlands University Matías Chacón Award Recipient	Taught Spanish in New Mexico Public Schools (15 years) New Mexico State Department of Education Bilingual Education Consultant (5 years) District Bilingual Education Coordinator (31/2 years) Adjunct Faculty (5 years)

				(2005) New Mexico Association for Bilingual Education (NMABE) Lifetime Achievement Award-Significant Contribution to Bilingual Education at the State Level	
Catherine Martinez Berryhill Associate Professor	Ph.D. Curriculum and Instruction with an emphasis on Learning Technologies New Mexico State University	Dean of NNMC COE and Faculty in Alternative Licensure Program: Secondary Education classes	Yes	Member of NM Deans Council, helping develop Teacher Education Accountability Reporting System, Worked with Espanola School District to develop Professional Development Academy, Worked with Math and Science Academy to develop and implement Masters of Arts in Teaching Math and Science program for area teachers in partnership with NMSU COE.	Licensed classroom teacher in NM 7-12 (23 years); Adjunct faculty (19 years); professional development (6 years); Administration (1.5 years) Additional P-12 experience as Headstart and preschool teacher and owner of a child care center (7 years).
Rose Cavalcante Assistant Professor	Ph.D. Educational/School Psychology University of Indiana	Full Time faculty (12 cr. Hrs. per semester) responsible for classes in educational psychology , pedagogy, human learning, classroom management, child development	yes	Member of the Assessment Committee charged with implementing an assessment plan for the entire institution. Past member and contributor to the NM Alternative Licensure Program Collaborative; current NM Diagnostician License; National Association of School Psychologists (NASP) member; ASCD member; Mentor at the Las Cumbres Early Childhood Mental Health Training Institute; Web page development PIT; Library PIT.	Licensed NM diagnostician currently working with students at Las Cumbres Developmental Center in Espanola; English teacher at Oca dos Curumins P-8 (2 years) in Brazil; Elementary School Counselor at the American School in Campanas, Sao Paulo, Brazil 92 years); School Psychologist at Northe Lawrence District, Bedford, Indiana (1 year). Adjunct Professor of educational psychology at Federal University of Sao Carlos, Brazil (2

					years) Adjunct Professor at the Catholic University of Campanas, Brazil (2 years).
Christina Esquibel Associate Professor	Ed. S. in Reading University of New Mexico	Full Time Faculty (12 cr. Hrs. per semester) responsible for classes in reading, diagnosis of reading, early childhood education, special education reading instruction	Tenured	Contributor to NM PED 2008-2009 P-12 Language Arts/Reading Instructional Materials adoption process. Past and current member (12/1/08) of the NM ECE Higher Education Taskforce. Presenter for NM Reading First District Sustainability Plan	New Mexico Level 3 licensed teacher. With reading, TESOL and ECE endorsements. Teacher licenses in Colorado and Washington state with 22 year P-graduate teaching experience. Literacy Coordinator for Penasco School District. Reading Recovery Teacher Leader; Colorado Springs, CO. Certified trainer for A Framework for Understanding Poverty; Served on NCATE BOE teams.
Emily Romero Associate Professor	Ph.D. in Curriculum and Instruction Denver University	Full Time Faculty (9hours/semester) Director of Field Placement; responsible for classes in supervised field experience, Art and Music in the classroom, and writing courses for NMTA preparation	Tenured	Representative to Faculty Senate at NNMC,	Colorado licensed teacher, English and Language Arts. Also served as a superintendent of schools in San Luis Colorado.
Camilla Bustamante Assistant Professor	Ph.D., MPH Health Education; Environmental Epidemiology, University of New Mexico.	Director of Environmental Science Program; Responsible for classes (3 cr. Hrs. per semester) in Science and Math for the Elementary Classroom I and	Yes	Sustainable Communities/Zeri; Student Learning and Assessment Committee; Chair of Sustainable Santa Fe Community; Dean and Directors Committee.	Licensed Classroom teacher Santa Fe Public Schools, teacher at De Vargas Middle School. Worker Qualification Team Leader with oversight of instruction for low to high risk technical processes for learners with educational

		II- BA students			capabilities ranging from grades 4 to post doctoral.
Adjunct Faculty/ staff					
Melissa Salazar Adjunct Faculty	Ph.D. Science Education – UC Davis	Responsible for classes (3 cr. Hrs per semester) in Teaching of Science	No	Teaching of inquiry-based science, health, and technology to K-12 teachers, especially those working with multicultural and multilingual student populations;	Science instructor for 12 years K-16 in State of California public and private schools including UC-Davis and Cal State – East Bay
Lorenzo Gonzales Adjunct Faculty	Ph.D. Curriculum and Instruction with an emphasis on Learning Technologies New Mexico State University	Responsible for classes (3 cr. Hrs. per semester) in Mathematics for the Elementary Classroom I and II—BA students	no	Golden Apple Fellows Committee member, NMPED Math and Science Task Force (advisory committee); US DOE Diversity Award 2008; Master Teacher with Math and Science Academy.	Licensed classroom teacher for 30 years. Science teacher at Cuba Middle and High Schools, recipient of the Golden Apple Award for Teaching; RETA Technology Resource (5 years); LANL (6 years)
Gladys Herrera-Gurule Adjunct Faculty	Ph.D. Linguistics and Bilingual Education University of New Mexico	Responsible for classes (3 cr. Hrs. per semester) in Bilingual Education for both pre-service candidates and in service teachers	no		Licensed classroom teacher; Spanish teacher in middle and high school. Bilingual Director. New Mexico State Public Education Bilingual Multicultural Education Unit Director; Assistant Superintendent for the Penasco School District.
Rudy Montoya Adjunct Faculty	Ph.D.	Responsible for PDS, TQEP, and professional development classes for PDS teachers	no		Licensed Counselor in K-12 schools as well as consultant in educational administration, teacher education, professional development and data gathering for decision-making. Has been Associate Superintendent, counselor, Special Education Director.
Mary Ellen	Ed. D.	Responsible for	no	Adjunct Faculty at	Greenville City

Seery Adjunct Faculty		classes (3 cr. Hrs. per semester) Special Education Methods and Materials ALP		the University of Dayton, OH; The long term effects of parenting – Keynote address, Family Support Services (2008); Building partnerships grounded in trust – Workshop at Family Support Services; Mentor at Las Cumbres Early Childhood Mental Health Training Institute.	schools consultant (2007); Adjunct faculty at University of Dayton (2004-present); Associate Professor (1997-2004)
Kathryn Sherlock Adjunct Faculty	Ph. D. in Educational Administration – Florida State University	Responsible for classes (3 cr. Hrs. per semester) in Bilingual and TESOL education for pre-service candidates and in service teachers	no	NMABE Senator Matias Chacon Award for Significant Contributions at the State Level (2007)	Santa Fe Public Schools, Educational Consultant (2008); NM PED, State Bilingual Education Consultant (2000-08); NM PED Department of Ed., Curriculum, Instruction, and Learning Technologies (1994-2000)

Among the faculty, there is diversity in academic experience, with one commonality: the faculty all have experience in P-12 schools either as classroom teachers, counselors and/or administrators. This experience brings relevance to pre-service candidates as they work to show competency in the areas required by the College of Education in the BA and Alternative Licensure Program. The combination of experience and education ensures that the professional education faculty have a comprehensive awareness of and insight into the content they teach. This extensive experience of successfully working with P-12 students as well as teachers and administrators allows them to integrate their knowledge with the reality of the classroom. This creates, for teacher candidates, experiences with their professors that are quite relevant, and gives candidates the added value of having faculty who are recognized educators, NM Public Education Department experts, administrators and award-winning teachers. These faculty members are a vital group of educators who are well-known in their fields of expertise. They represent a dynamic group of educators who are striving to integrate their expertise and experience into the classroom experience of candidates. Some faculty members are currently developing or have recently developed research in their respective areas of expertise, with resulting articles, while other faculty members are in the process of developing research projects. For some, partnerships with other institutions of higher education have resulted in rich fields of action research projects.

Teaching by the faculty of the College of Education is reflective of the competencies and proficiencies expected of Level Three teachers in New Mexico. The expectations are listed in NNMC's College of Education Conceptual Framework and are a part of every

syllabus in the COE. Student-centered teaching is core to the expectations of the faculty, with each faculty member being aware of the development of candidate competencies as well as dispositions. As described in the course syllabi, all faculty are technology experts who can use technology as a tool for learning or can use technology as a vehicle for learning (e.g. online or hybrid classes), and are able to incorporate authentic assessment as well as take into account student diversity in learning style and special needs.

Additional science and math content area faculty will be recruited from the College of Arts and Sciences. Faculty members in these departments have indicated interest in participating in the Master's programs. These faculty members are experts in a variety of areas. (See Appendix)

(2) Library and Other Academic Support Services

Because of an existing Bachelor's degree in Information Technology and other programs in math and science, Northern New Mexico College is well prepared to start an M.A. program. Also due to the institution's location in a technology intensive area of Santa Fe/Los Alamos/Española Valley with many local industries and a national government laboratory, excellent practicing professionals are available to teach design-oriented courses as adjunct faculty.

Also, because of the existing support for the B.A. Program in Elementary Education and other B.S. programs in science and technology fields, support is in place for library resources and other academic activities. Additionally, the library received funding to put in place a wide variety of online databases for research purposes.

(3) Physical Facilities

NNMC is in the process of constructing a building for the College of Education. This building will house all classes and contain a lab for science classes and mobile lap top labs for use throughout the building. Occupancy is scheduled for 2010.

(4) Equipment and Technological Resources

Existing equipment and resources are not sufficient to support the M.A. program; however, in the new building there will be sufficient room to house offices and classes for the new program.

(5) Other or External Resources Required

No other resources, whether internal or external, are required to implement the proposed program.

E. Projected Costs of the Program

The program must include a clear analysis of the project cost of the proposed program and the sources of funding that will support it.

(1) New Cost for Program Startup

Budget: The five year budget is shown in Table 4. The first year shown is for 2010-11, the first year of operation of the proposed M.A. programs in the College of Education. Start up expenses that include only direct costs total $60K plus $75K for the first two years. These can be absorbed with projections for I&G revenue for current programs, if no additional overhead is assumed. This is a plausible assumption if no additional equipment, classrooms, utilities, services are assumed for the small number of students served during the first two years. SCH funding for 2008-9 at Tier 1 Graduate level was assumed for the computations.

Table 4 Five Year Budget – Direct Expenses & OH ($000)					
Year	1	2	3	4	5
Total I&G at Tier 1 Formula	$670.64	$670.64	$670.64	$670.64	$670.64
Total SCH	180	360	540	540	540
Full time Faculty Labor Costs ($0.5K/SCH) @80%; Class of 15	$72	$144	$216	$216	$216
Part time Faculty Labor Costs ($0.125K/SCH) @20% Class of 15	$4.50	$9	$13.50	$13.50	$13.50
Other Expenses at 20% DL	$15.30	$30.60	$45.90	$45.90	$45.90
Total Direct Expense	$76.50	$153	$382.50	$382.50	$382.20
Overhead (OH) Expense	$168.30	$336.60	$657.90	$657.90	$657.90

• *Faculty:* For the first 2-3 years existing faculty should be adequate for the program. If enrollments increase at the projected rates, additional faculty lines will be requested in the third year since the earned I&G revenue will be able to support them.
• *Library:* No additional costs for the first five years.
• *Facilities, Equipment, Technological Resources:* Assumption: the new Education Building will be ready for occupancy by the beginning of the MAT.
• *Dean.* The current Dean position is expected to handle any additional work load for the first two years.
• *Supplies and Expenses:* Flyers and forms will be required to start up the program at an estimated cost of $3,000 for the first year, a budget item included in the projected budgets.

(2) State Support

In Table 2 the student credit-hour estimates are used to estimate I&G revenue for the first five years. Grants currently supporting academic activities in the College of Education are excluded since they are term limited and cannot be assumed to persist after their designated terms.

(3) Other Support

No specific direct support from other sources is identified at this time. However, it is expected that some support will be forthcoming from research contracts and/or training grants from industry before the end of year-three. None of this research funding is assumed in the budget forecast. Given the New Mexico Public Education Requirement for attaining Level III status and recent history of tuition support by local education agencies, it is expected that local K-12 education agencies will contribute to student tuition costs

F. Quality of the Program

The program will comply with Higher Learning Commission accreditation standards and AQIP process monitoring that has been in place at Northern New Mexico College for three years. A GPA of 3.0 is required for graduation. The National Council for Accreditation of Teacher Education includes accreditation of graduate programs for teachers. The College of Education at NNMC is accredited through the state NCATE process, and will be applying for national accreditation in 2010. These standards and the accreditation are indicators of quality. All requirements of the New Mexico Higher Education Department, the New Mexico Council of Graduate Deans and the New Mexico Public Education Department will be met.

(1) Assessment Procedures

College of Education assessment procedures follow the institution's requirements for the use of data to determine changes in program, delivery or content. The data collected for this process includes admission criteria, grades, course evaluations, faculty evaluations, satisfaction surveys, employability surveys and follow up surveys. The data is collected, analyzed and action plans are created to reflect the findings.

The institution has an Assessment of Student Learning Department that is dedicated to the collection and use of data to determine instructional effectiveness. The College of Education participates fully in this process.

Specific program outcomes are found in Tables 1 and 2, indicated by numbers of graduates expected by 2014. The intent of the program is to follow up with surveys to determine when teachers pass to Level III in the NM 3 Tier Licensure System.

(2) Quality Assurance Measures

Metrics being used for undergraduate programs in the College of Education as quality assurance measures of student learning include project reports, quizzes, homework, exams, and class presentations. These metrics will be used to assure consistency in quality of the Master's programs in Education.

G. Assessment of Operations and Impact

The proposal must include a plan by which the proposed program will be assessed for its operation and impact over at least a five year period.

Assessment of operations and impact will be monitored by the advisory committee, the Professional Teacher Education Advisory Council, which has already reviewed this proposal at its Fall, 2008 meeting. The PTEAC assists the College of Education in determining the impact of the program on student achievement in area schools by accessing New Mexico State Standards Based Assessment student data of alumni classrooms.

(1) Monitoring Methodology

Continuous improvement (AQIP) requires that students are frequently asked for feedback on the efficacy of instruction. Therefore, each course and instructor undergo review at the end of each semester. This data is used to review instructor effectiveness. Alumni surveys and employer surveys will also demonstrate program effectiveness. Additionally, the provost requires program reviews every three years.
This proposal will also be submitted to the HLC for review and approval. Upon obtaining approval the program will undergo the same monitoring and assessment process of existing programs that have been accredited by HLC.

(2) Evaluations from Stakeholders

Partners of the College of Education include Los Alamos National Laboratory, Northern New Mexico Network for Rural Education, local school districts, Los Alamos National Laboratory Foundation, the Northern New Mexico Math and Science Academy, and the United States Department of Education Office of English Language Acquisition, and the advisory council, PTEAC. These partners along with faculty, staff and most importantly students, are frequently asked to provide evaluations of program and instruction.

H. Administrative responsibility for program and Institutional Commitment

There must be clear indication in the proposal that the institution is committed to the success of the proposed program.

(1) Departmental Responsibility

The NNMC College of Education is responsible for implementing and administering the program. The departmental faculty and administrative staff are deemed adequate for supporting the proposed programs.

(2) Administrative Support

The NNMC Administration with the support of the Board of Regents continues to support the current COE Bachelor's program and has approved the new Master's programs described within as complementary and necessary to the continued professional development and training of teachers.
Additional funding for TA and RA positions has been requested through a RPSP submission to the January 2010 NM Legislature in the amount of $300 thousand for both engineering and teacher education Master's programs anticipated to start in Fall 2010. In addition a $2.5 million Title V (graduate) grant has been requested from the US Department of Education for administrative and academic support of the same engineering and teacher education programs.

APPENDIX A

Course Offerings

The proposed program of study for both the Master of Arts in Teaching and Learning and the Master of Arts in Teaching Mathematics and Science are detailed below in three parts. Core courses for both programs in order of occurrence are first presented before the individual course descriptions and listing of faculty members who have the interest and the ability to teach each of the courses.
The proposed curricula consist of a master level core of courses related to:
Cognitive Principles to Curriculum and Pedagogy
Probability and Statistics
Technologies and Strategies that Support Teaching and Learning
Cognition
Data Collection and Analysis
Classroom Action Research

Both programs consist of twelve (12) courses of three (3) credits each, which can be taken over two and one half calendar years or 8 semesters including summers. The program is designed for cohorts that will begin the program each summer. Intended for working teachers, the programs will offer two to three courses during summer sessions, and one course each Fall and Spring semester.
One thread that runs through both the Master of Arts in Teaching Mathematics and Science is the teaching of critical thinking. The program places an emphasis on critical thinking because the underlying goal of all education is to create in its citizenry the ability to think flexibly and with fluidity within a given domain. The program believes that thinking, whether scientific thinking, mathematical thinking or critical thinking in general can be taught in an organized, systematic fashion within an educational context.

Master of Arts in Teaching Course Descriptions

Core Courses for Master of Arts in Teaching and Learning in order of occurrence

1. EDUC 520: Applying Cognitive Principles to Curriculum and Pedagogy

2. EDUC 525: Beyond the Numbers: Classroom Technology Tools for Data Analysis and Decision Making
3. EDUC 531: Cognition: Current Brain Research and Its Applications in the Classroom
4. EDUC 532: A Standards-Based Education Curriculum: Formative Assessment to Assessment for Learning
5. EDUC 533: Creating and Sustaining Professional Learning Communities in the Schools
6. EDUC 529: Web and Digital Technologies and Strategies that Support Teaching and Learning
7. EDUC 528: The Humanities Across the Curriculum: Helping Teachers Think and Value Strategies for Teaching the Humanities
8. EDUC 521: The History and Philosophy of Mathematical and Scientific Thinking: Conceptual Thinking and Instruction in Mathematics and Science
9. EDUC 527: Multicultural and Linguistic Considerations in Student Achievement and Learning
10. EDUC 530: "Things that Make Us Smart:" Teaching and Learning in an Online Environment
11. EDUC 534: Introduction to Disciplined Inquiry
12. EDUC 595: Classroom Action Research (Capstone Course)

Course Descriptions

EDUC 520 Applying Cognitive Principles to Curriculum and Pedagogy
This course explores specific principles of cognitive science (e.g., memory pathways, emotions, metaphors, mental models, multiple forms of representation to include non-linguistic forms of representation) that impact curriculum design, assessment, classroom management and pedagogy. Students will study research-based instructional and assessment strategies for aligning course content to learning goals and evaluation procedures designed for increasing student achievement, learning, and thinking. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications; and design a small-group research project to present in a poster symposium.

EDUC 525 Beyond the Numbers: Classroom Technology Tools for Data Analysis and Decision Making
This course focuses on the use of school-based data gathering, data analysis and decision-making tools and techniques. The course is developed specifically to assist teachers and other school personnel utilize the latest web and desktop technologies for analysis of student achievement data used for decision-making at the district and school unit levels. Students complete a term project, the choice of which is based on individual interest, typically the development of a classroom research project, which illustrates the student's understanding of the qualitative and/or quantitative research principles and methods.

EDUC 531 Cognition: Current Brain Research and Its Applications in the Classroom
This course explores the most current brain research and its applications to teaching, learning and thinking. The course advances the neuroscience understanding of brain

structure, plasticity, neurogenesis, memory pathways, focused attention, motivation and emotions in teaching, learning and thinking. The course also examines the interplay between the conscious and unconscious and their connection to thinking. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications, and design a small-group research project to present in a poster symposium.

EDUC 532 A Standards-Based Education Curriculum: Formative Assessment to Assessment for Learning

This course brings together the New Mexico State Math and Science Content Standards with the Math and Science Entry-Level Competencies for Pre-Service Teachers in the context of assessment strategies and techniques for student achievement and learning. Class format will be a combination of lecture, hands-on analysis of student work both oral/written production, and discussion. Students will be expected to participate in discussions, write brief papers integrating material from the readings and lectures and design a analysis of students' work using formative assessment strategies, the choice of subject matter is based on individual interests.

EDUC 533 Creating and Sustaining Professional Learning Communities in the Schools

This course examines professional learning communities as a best practice for enhancing student achievement and learning through the following questions: What are professional learning communities? How do they work and how do they affect student learning? How do they inform teacher practice? What are the roles of principals, teachers and parents? Three papers are required.

EDUC 529: Web and Digital Technologies and Strategies that Support Teaching and Learning

This course provides the student with digital technology (e.g., Microsoft Office Applications, animated graphics, and interactive web sites) and instructional strategies that mediate teaching, learning and thinking. It investigates how the form of representation determines how the learner thinks, what the learner thinks and what the learner produces. Application of Internet resources, new digital technologies and software for delivering synchronous and asynchronous curriculum and classroom instruction are emphasized. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students complete a term project, typically the development of a curriculum topic in the integration of technology in the classroom, the choice of which is based on individual interest.

EDUC 528 The Humanities Across the Curriculum: Helping Teachers Think and Value Strategies for Teaching the Humanities

The purpose of this course is to examine and discuss the nature and use of subject matter, learning objectives, learning activities, teaching strategies and evaluation in helping students think and learn. The course is a medium for teachers to think systematically about planning for instruction by examining the nature of student thinking and learning.

There are weekly readings. Class format includes activities, discussion, and brief lectures. Three papers are required.

EDUC 521 The History and Philosophy of Mathematical and Scientific Thinking: Conceptual Thinking and Instruction in Mathematics and Science
This course examines the historical, philosophical and empirical foundation for effective mathematics and science instruction. The course includes issues in mathematics and science curricula, analysis of reform instructional materials and the design of a generalizeable math and science curricula. The course includes methods for monitoring student progress and adjusting instruction to meet individual student needs. Class format includes activities, discussion, and brief lectures. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications; and design a small-group research project to present in a poster symposium.

EDUC 527 Multicultural and Linguistic Considerations in Student Achievement and Learning
This course examines research on the social and political contexts of learning and teaching English as a second language; analyzes multidisciplinary studies on culture with reference to language in the school setting and society; and examines how educational environments impact second language learners' attitude and identities as well as teachers' instructional approaches.

EDUC 530 "Things that Make Us Smart:" Teaching and Learning in an Online Environment
This course shows how to create an online community that engages students with subject matter and serves as a medium for intellectual growth and transformative learning. The course explores manipulatives, new web and technology tools and resources for designing a curriculum unit in a content area. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students complete a term project, typically the development of a curriculum topic, the choice of which is based on individual interest.

EDUC 534 Introduction to Disciplined Inquiry
This course explores various research approaches and methodologies included in education including experimental and quasi-experimental methods; anthropological and case study methods; evaluative research and field studies; correlational; and sociological, historical, and philosophical research. Topics include library research and research criticism.

EDUC 595: Classroom Action Research (Capstone Course)
The Action Research Course provides the student with a scholarly, systematic approach to proposing solutions to classroom problems by examining teacher practice and student learning. The process of examining a classroom problem involves the teachers developing the view and skills of a researcher: problem-posing, review of other scholarly work, collecting of data and information, and displaying results in a coherent, integrated

fashion that ultimately results in a possible solution to the problem. Ultimately, however, this systematically-evolving process changes both the researcher and the classroom situation. Classroom Action Research Projects are presented in an APA format designed to include a literature review, discussion of method, collection and analysis of data and proposal of solutions. Formal presentation of projects before a committee is expected before completion of the program. Students may desire to continue the expansion of projects carried out for EDUC 525 as long as the projects exhibit considerable thought and effort beyond the earlier version.

Core Courses for Master of Arts in Teaching Mathematics and Science in order of occurrence

1. EDUC 520: Applying Cognitive Principles to Curriculum and Pedagogy
2. EDUC 522: Probability and Statistics
3. EDUC 523: Earth/Environmental Science: An interdisciplinary Approach
4. EDUC 526: Fundamentals of Algebra and Geometry: A Way of Thinking and Viewing the World
5. EDUC 529: Web and Digital Technologies and Strategies that Support Teaching and Learning
6. EDUC 535: Fundamentals of Number and Operations: The Integer, Rational and Irrational Number Systems
7. EDUC 536: Mathematics in Science: Measurement, Ratios and Proportional Reasoning in the Science Classroom Laboratory
8. EDUC 531: Cognition: Current Brain Research and Its Applications in the Classroom
9. EDUC 537: Life Science: An Inquiry-Based Approach
10. EDUC 538: Geology: A Site-based Experience for Teachers
11. EDUC 525: Beyond the Numbers: Classroom Technology Tools for Data Analysis and Decision Making
12. EDUC 595: Classroom Action Research

Course Descriptions

EDUC 520 Applying Cognitive Principles to Curriculum and Pedagogy
This course explores specific principles of cognitive science (e.g., memory pathways, emotions, metaphors, mental models, multiple forms of representation to include non-linguistic forms of representation) that impact curriculum design, assessment, classroom management and pedagogy. Students will study research-based instructional and assessment strategies for aligning course content to learning goals and evaluation procedures designed for increasing student achievement, learning, and thinking. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications; and design a small-group research project to present in a poster symposium.

EDUC 522: Probability and Statistics

This course is an applied statistics course for students with no previous background in statistics who will need statistics in their further studies and their work. The focus is on understanding and using statistical methods in research and applications. Topics include: descriptive statistics, probability theory, random variables, random sampling, estimation and hypothesis testing, basic concepts in the design of experiments and analysis of variance, linear regression and contingency tables. The course uses a combination of old technology, pencil and paper, and ubiquitous statistical technology (e.g., TI 84 and Microsoft Excel and web interactive statistical tools).

EDUC 523: Earth/Environmental Science: An Interdisciplinary Approach
This course develops in teachers a deep understanding of pedagogical-content knowledge in Earth/Environmental Science. This course explores Earth's natural systems function and how human activity affects the environment; students will apply the scientific method to investigate natural flows of chemicals, water and energy in terrestrial, aquatic, and atmospheric systems, and how humans impact these natural flows and systems. Students complete a term project, the choice of which is based on individual interest, typically the development of a controlled experiment, which illustrates the student's understanding of the scientific method and the collection and analysis of data.

EDUC 526: Fundamentals of Algebra and Geometry: A Way of Thinking and Viewing the World
This course develops in teachers a deep understanding of pedagogical-content knowledge in mathematics. This course explores discrete and integrated topics in algebra and geometry concepts and applications focused around problem solving, reasoning and proof, communication, connections, representation and mathematical thinking. The course investigates mathematical notation as essential to students' development of mathematical thinking. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications; and design a small-group research project to present in a poster symposium.

EDUC 529: Web and Digital Technologies and Strategies that Support Teaching and Learning
This course provides the student with digital technology (e.g., Microsoft Office Applications, animated graphics, and interactive web sites) and instructional strategies that mediate teaching, learning and thinking. It investigates how the form of representation determines how the learner thinks, what the learner thinks and what the learner produces. Application of Internet resources, new digital technologies and software for delivering synchronous and asynchronous curriculum and classroom instruction are emphasized. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students complete a term project, typically the development of a curriculum topic in the integration of technology in the classroom, the choice of which is based on individual interest.

EDUC 535: Fundamentals of Number and Operations: Making Sense of the Integer, Rational and Irrational Number Systems
This course develops in teachers a deep understanding of pedagogical-content knowledge in mathematics. This course explores the nature of mathematical thinking through the examination of operations of the most problematic of the number systems (Integer, Rational and Irrational) to teach and learn in elementary mathematics. The course focuses on the relationship of the whole number system to the integer, rational and irrational number systems' properties to common rational errors made by students when learning to think mathematically and the instructional strategies to overcome the causes of rational errors. Students complete a term project with emphasis on hands-on applications of cognitive principles to relevant practical classroom situations.

EDUC 536: Mathematics in Science: Measurement, Ratios and Proportional Reasoning in the Science Classroom Laboratory
This course develops in teachers a deep understanding of pedagogical-content knowledge in mathematics as it relates to scientific thinking. This course specifically explores the use of measurement (linear, area, capacity, weight, and mass), ratios and proportional reasoning in the context of a physical science laboratory classroom. The course emphasis is on the use of laboratory classroom instrumentation to measure, collect and analyze data in an effort to connect mathematics to science through application. The course mantra is "There is no science without the mathematics." Students complete a term project, the choice of which is based on individual interest, typically the development of a controlled experiment, which illustrates the student's understanding of the scientific method and the collection and analysis of data. Students may desire to continue the expansion of projects carried out for EDUC 526 as long as the projects exhibit considerable thought and effort beyond the earlier version.

EDUC 531: Cognition: Current Brain Research and Its Applications in the Classroom
This course explores the most current brain research and its applications to teaching, learning and thinking. The course advances the neuroscience understanding of brain structure, plasticity, neurogenesis, memory pathways, focused attention, motivation and emotions in teaching, learning and thinking. The course also examines the interplay between the conscious and unconscious and their connection to thinking. There are weekly readings. Class format includes activities, discussion, and brief lectures. Students are expected to participate in discussions, write brief papers integrating material from readings and lectures, bearing in mind their educational implications; and design a small-group research project to present in a poster symposium.

EDUC 537: Life Science: An Inquiry-Based Approach
This course develops in teachers a deep understanding of pedagogical-content knowledge in life science. This hands-on course enhances teachers' pedagogical knowledge of basic life science principles while exploring models of inquiry and instructional strategies that facilitate students' scientific thinking and learning of science. The course investigates the key biological concepts of evolution and morphological structure, cell and germ theories, mitosis and meiosis, energy production and consumption, and limiting factors that

influence life. Students complete a term project, typically the development of a course topic that enhances the students' deeper understanding of the subject matter.

EDUC 538: Geology: A Site-based Experience for Teachers
This course develops in teachers a deep understanding of pedagogical-content knowledge in geology and hydrology. This course is focuses on the fundamentals of geology using the surrounding geology of northern New Mexico as its open-air, backyard classroom. In an attempt to give students an understanding of the dynamic relationship between the earth and its atmosphere, this course examines six questions: How has the Earth evolved? What causes climate and climate change? Why are there ocean basins, mountains, and continents? Why is the Earth habitable? What are the effects of climate, weather, water and Earth's internal heat on its surface? All of the above are explored within the context of northern New Mexico's readily accessible geologic structures, (e.g., Valles Caldera, Toldito and Entrada formations in the Ghost Ranch area as well as the basaltic formation, dikes and related structures in the Taos and Abiquiu areas). Students complete a term project, the choice of which is based on individual interest.

EDUC 525: Beyond the Numbers: Classroom Technology Tools for Data Analysis and Decision Making
This course focuses on the use of school-based data gathering, data analysis and decision-making tools and techniques. The course is developed specifically to assist teachers and other school personnel utilize the latest web and desktop technologies for analysis of student achievement data used for decision-making at the district and school unit levels. Students complete a term project, the choice of which is based on individual interest, typically the development of a classroom research project, which illustrates the student's understanding of the qualitative and/or quantitative research principles and methods.

EDUC 595: Classroom Action Research (Capstone Course)
The Action Research Course provides the student with a scholarly, systematic approach to proposing solutions to classroom problems by examining teacher practice and student learning. The process of examining a classroom problem involves the teachers developing the view and skills of a researcher: problem-posing, review of other scholarly work, collecting of data and information, and displaying results in a coherent, integrated fashion that ultimately results in a possible solution to the problem. Ultimately, however, this systematically-evolving process changes both the researcher and the classroom situation. Classroom Action Research Projects are presented in an APA format designed to include a literature review, discussion of method, collection and analysis of data and proposal of solutions. Formal presentation of projects before a committee is expected before completion of the program. Students may desire to continue the expansion of projects carried out for EDUC 525 as long as the projects exhibit considerable thought and effort beyond the earlier version.

Appendix B

Additional Faculty for Master's Programs Qualifications

Name	Title	Years of Experience	Areas of Study	Courses Taught
Melissa Salazar	Master Teacher	K-16 (12)	Chemistry; Food Science;	Teaching of Science
Barbara G. Devolder, PhD	Scientist, Applied Physics Division	Higher Ed. And Science Research (35)	Applied Mathematics	Applied Mathematics, Advance Calculus, ordinary differential equations
Cathy Berryhill, PhD	Dean	PreK-12 (10)	Elementary and Secondary Education	Pedagogy Technology for Educators Curriculum Construction
Lorenzo Gonzales, PhD	Master Teacher	K16	Science, Mathematics	Methods in K8 Mathematics
Andres Salazar, PhD	Assoc. Provost - Graduate Studies	Business and Higher Ed (35)	Business, Engineering, Mathematics	Engineering, Research and Development, Business for Entrepreneurs
Anthony Sena, PhD	Provost	Higher Ed. (25)	Biological Science	Life Science, Research
David Torres, Ph.D.	Faculty, Mathematics	Higher Ed (10)	Mathematics	Calculus, Algebra, Physics

MELISSA L. SALAZAR, PH.D.

Address: 24A Lower Firehouse Rd, Espanola, NM 87532
Phone: 916-833-1240
Email: melissa.salazar@gmail.com

RESEARCH INTERESTS & SKILLS

- Teaching of inquiry-based science, health, and technology to K-12 teachers, especially those working with multicultural and multilingual student populations;
- Best practices for school-based health and nutrition interventions and prevention programs;
- Use of digital technology projects with English Language Learners to promote language literacy.

EDUCATION

UNIVERSITY OF CALIFORNIA AT DAVIS DAVIS, CA

Ph.D., Science Education (Health/Nutrition emphasis)

Dec 2008

Dissertation: *Ni de Aqui, Ni de Alla (Neither here nor there): Immigrant Children, Food and Schools in America*

M.S., Food Science & Technology Dec 2003

Thesis: *Influences of Dietary Attitudes and Acculturation on the Calcium Intakes of Asian and Hispanic Preadolescent Girls in Sacramento, CA*
Advisors: Dr. Christine Bruhn, Cooperative Extension Specialist, UC Davis
Dr. Marta Van Loan, Western Health Nutrition Research Center, USDA

UNIVERSITY OF CALIFORNIA AT BERKELEY BERKELEY, CA

B.S., Chemistry (Chemical Engineering minor) May 1995

ACADEMIC PUBLICATIONS

Salazar, M., Feenstra, G. & Ohmart, J. (2007). "Salad Days: Visualizing Children's Use of a Salad Bar Program". In *Food & Culture: A Reader*, 2nd Edition, Carole Counihan & Penny Van Esterik, Eds. (Routledge).

Salazar, M. (2007). "Public schools, private foods: *Mexicano* memories of taste and conflict in American school cafeterias." *Food & Foodways* 15 (3-4): 153-181.

Nettles, K., & Salazar, M. (2004). "Foods of the Pacific Region", pp. 235-274 in *The Pacific Region: The Greenwood Encyclopedia of American Regional Cultures*, Eds. Goggans J. with DiFranco, A. Westport, CT: Greenwood Publishing Group.

CONFERENCE & SYMPOSIA PRESENTATIONS

Salazar, M. (February 2008). *Bodies at Rest, Bodies in Motion: Mapping Immigrant Children's Food Lives.* Paper presented at 2008 Southwest/Texas Popular Culture/American Culture Association, Albuquerque, NM.

Salazar, M. (February 2008). *Hanging Around in Millennial Schools: issues in using visual methods and ethnography with ELLs in today's school setting.* Paper presented as part of panel I organized addressing how to do ethnographic work with ELL students in middle and high school settings. Panel was part of Symposium on Ethnography in Education, University of Pennsylvania School of Education, Philadelphia, PA.

Salazar, M. (August 2007). *Kids, cameras, and schools: the good, the bad and the ugly of doing video and photography work in "Millennial" K-12 schools*. Paper presented at the International Visual Sociology Association, New York University, NY.

Salazar, M. (June 2007). *"Imaging/Imagining Food"*. Panel chair and organizer. Association for the Study of Food and Society, University of Victoria, BC, Canada.

Salazar, M. (June 2007). *How do we do food studies?: Potential for future publications of cross-disciplinary work in food studies.* Organized and facilitated roundtable discussion. Association for the Study of Food and Society, University of Victoria, BC, Canada.

Salazar, M. (March 2007). *Life in the middle: underground documentary work of children.* Paper presented at the Curious Lives of Documents Symposium, UC Davis Anthropology Program.

Salazar, M. (February 2007). *How do we do food studies*: *Surveys of current food methodologies.* Organized 20 presenters into 5 panels of presentations on interdisciplinary food studies methodologies. Southwest/Texas Popular Culture/American Culture Association, Albuquerque, NM.

Salazar, M. (August 2006). *Public schools, private foods: Mexicano memories of culture and conflict in American school cafeterias.* Paper presented at Mujeres Activas en Letras y Cambio Social (MALCS) Annual Meeting, UC Santa Cruz, CA.

Salazar, M. (May 2006). *Counting Croutons: Children's Food Culture in the Cafeteria*. Paper presented at Founding Food Studies Graduate Student Interdisciplinary Symposia, UC Davis, Davis, CA.

Salazar, M. (March 2006). *Seeing Kids' Worlds: Children's folk use of food materials.* Invited speaker, Symposia on Museums and Object Literacy, Magnes Museum, Berkeley, CA.

Salazar, M. (February 2006). *Explaining "taste": the Cartesian culture of sensory science.* Paper presented at Southwest American Popular Culture Association, Albuquerque, NM.

Salazar, M. (June 2005). *At first I didn't like it:* Mexicano *memories of American school cafeterias.* Paper presented at Association for the Study of Food and Society Annual Conference, Portland, OR.

Salazar, M. (June 2005). *Feeding the Little Masses: 100 years of school cafeterias in photographs.* Paper presented at Association for the Study of Food and Society Annual Conference, Portland, OR.

Salazar, M. (June 2005). *Qualitative visual analysis of student's self-serve salad bar behaviors*. Paper presented at Association for the Study of Agriculture and Human Values, Portland, OR.

Salazar, M. (May 2005). *My favorite subject is…lunch! Students negotiate food and identity at school.* Paper presented at UC Davis Consortium for Women in Research Spring Speaker Series, Davis, CA.

Salazar, M. (February 2005). *Mexican students' negotiation of food and identity in American school cafeterias*. Paper presented at Southwest American Popular Culture Association, Albuquerque, NM.

Salazar, M., Ohmart, J. & Feenstra, G. (October 2004). *Plate Tectonics: Do salad bar programs really shift students' diets?* Paper presented at 2004 Community Food Security Coalition National Meeting, Milwaukee, WI.

Salazar, M. (August 2004). *Counting Croutons: What students do with self-serve salad bars.* Paper presented at the 2004 International Visual Sociology Conference, San Francisco, CA.

Salazar, M., Bruhn, C., Schaefer, S., & Van Loan, M. (July 2004). *Influences on calcium intakes of Asian and Hispanic preadolescent girls in Sacramento, CA.* Poster presented at 2004 International Food Science & Technology Conference, Las Vegas, NV.

Salazar, M., Bruhn, C., Schaefer, S. & Van Loan, M. (October 2003). *Influences on calcium intakes of Asian American girls.* Poster presented at 2003 International Food Science & Technology Meeting, Southern Yangtze University, Wuxi, P.R.China.

GRANTS, FELLOWSHIPS & AWARDS

- UC Davis School of Education Community Service Award, 2008
- American Anthropological Association Society of Anthropology of Food and Nutrition: Christine Wilson Award for Outstanding Graduate Research Paper, 2007 ($100)
- UC Davis Dissertation Year Fellowship, 2007-08 ($27,000)
- UC Davis School of Education Teaching Fellowship, 2007-08 ($5000)
- UCD School of Education Most Promising Scholar Award, 2007
- UC Davis Humanities Graduate Research Fellowship, 2006-07 ($1,500)
- UC Davis Consortium for Women in Research Travel Award, 2006 ($550)
- UC Davis School of Education Block Grant, 2006-07 ($5,000)
- UC Davis School of Education Summer Research Fellowship, 2006 ($4,000)
- UC Davis Steindler Graduate Student Fellowship, 2003-2005 ($40,000)
- UC Davis School of Education Block Grant, 2005-06 ($6,000)
- UC Davis School of Education Summer Research Fellowship, 2005 ($4,000)
- Graduate Student Association Travel Award, 2005 ($250)
- UC Davis School of Education Travel Award, 2005 ($600)
- John Muir Institute on the Environment: Bioregional Research Graduate Student Grant, 2003-2005 ($1,500)
- UC Davis Food Science International Student Representative to Wuxi, P.R. China, 2003 ($1,000)
- UC Berkeley Regents Scholar, 1990.

TEACHING EXPERIENCE

UNIVERSITY LEVEL

LECTURER, *TEACHING CREDENTIAL PROGRAM* SEPT 2008-PRESENT
DEPARTMENT OF TEACHER EDUCATION, CALIFORNIA STATE UNIVERSITY, EAST BAY
Taught single and multiple subject teaching credential candidates preparing to be California certified teachers. Classes included Equity and Diversity in Education, Instructing English Language Learners, School-Based Health, and Science Education for Elementary Teachers.

LECTURER, *CHILDREN, LEARNING AND MATERIAL CULTURE* JAN-MARCH 2008
SCHOOL OF EDUCATION, UNIVERSITY OF CALIFORNIA, DAVIS
Upper division undergraduate class for Education minors. Topics relate to children, youth culture, and educational institutions. Special focus on using digital storytelling to present classroom research. Prepared and graded exam questions.

CO-INSTRUCTOR, *SEMINAR ON COLLEGE TEACHING* MARCH 2007
TEACHING RESOURCES CENTER, UNIVERSITY OF CALIFORNIA, DAVIS
Co-instructed 10-week course designed to certify UC Davis graduate students, Postdoctoral scholars, and Associate Instructors in best practices in undergraduate teaching. Class focused on classroom diversity, cognition & learning theories, and research on student-centered and project-based teaching.

CO-INSTRUCTOR, *PROFESSIONAL DEVELOPMENT SEMINAR* FALL 2005
SCHOOL OF EDUCATION, UNIVERSITY OF CALIFORNIA, DAVIS
Developed new 1-unit course for graduate students in Education Ph.D. program. Class focused on introducing variety of careers possible in the field of Education.

CO-INSTRUCTOR, *INTRODUCTION TO FOOD SCIENCE* SUMMER 2003
DEPARTMENT OF FOOD SCIENCE, UNIVERSITY OF CALIFORNIA, DAVIS
Taught undergraduate course in introductory food science principles with two other Food Science graduate students. Was solely responsible for developing and instructing nine hours of lecture material on consumer food studies. Wrote and administered exam for course.

TEACHING ASSISTANT, *ETHNOGRAPHIC METHODS IN EDUCATION* 2005-2007
SCHOOL OF EDUCATION, UNIVERSITY OF CALIFORNIA, DAVIS
Facilitated classroom meetings for two-quarter length advanced ethnographic methods course for UC Davis graduate students. Guided and advised students in their ethnographic projects and in writing up their research for publication.

TEACHING ASSISTANT, *CHILDREN, LEARNING, AND MATERIAL CULTURE* 2004-2005
SCHOOL OF EDUCATION, UNIVERSITY OF CALIFORNIA, DAVIS
Assisted professor with preparing and grading exam questions, and assessing student website portfolios for general education course with more than 50 students. Assisted students with preparing and uploading their web projects using Dreamweaver.

K-12 TEACHING

ENGLISH LANGUAGE DEVELOPMENT CLASSROOM INSTRUCTIONAL ASSISTANT 2006-07
NATOMAS MIDDLE SCHOOL, SACRAMENTO, CA
Assisted classroom teacher in teaching English literacy to 60 immigrant and second-generation children placed in multiple ELD level Language Arts classes in public middle school. Designed and instructed health-related ELD technology and literacy projects using Microsoft MovieMaker and Photostory3.

SCIENCE INSTRUCTOR/ENRICHMENT PROGRAMS COORDINATOR 1998-2000

CHABOT SPACE & SCIENCE CENTER, OAKLAND, CA

Responsible for development of new science programs, summer camps, and family community science events for large Bay Area science center affiliated with Oakland Unified School District. Responsibilities included writing science curriculum, purchasing and organizing teaching equipment, training new teaching staff and volunteers, and outreach marketing for these programs to Oakland Unified students and families. Wrote grant proposals and progress reports, and managed program budgets for these programs. Served as primary public contact for visitors to Science Center.

CHEMISTRY INSTRUCTOR/LAB COORDINATOR/MANAGER 1996-1998

LAWRENCE HALL OF SCIENCE, BERKELEY, CA

Responsible for preparing, organizing, and teaching hands-on chemistry classes for Pre-K to 12th grade using Guided Discovery teaching methods. Teaching ranged from classes taught on site at LHS to outreach programs taken to schools, ranging from a single class of 20 to an audience of 400 at S. F. Bay Area primary and secondary schools. Assisted teaching staff in evaluating and improving existing programs. Managed budgets and supplies for Chemistry teaching laboratory, as well as managed schedules, H.R. issues, and training of college student employees working in Chemistry teaching laboratory.

SCIENCE TEACHING CONSULTANT Sept 2008-present
COMMUNITY RESOURCES FOR SCIENCE/PIEDMONT MIDDLE SCHOOL, BERKELEY, CA

Train and supervise professional scientists from UC Berkeley and Lawrence Berkeley Laboratory in a volunteer project where they design and teach content and age-appropriate lessons to public middle school students in San Francisco Bay area.

ELL TEACHER PROFESSIONAL DEVELOPMENT Spring 2008
NATOMAS UNIFIED SCHOOL DISTRICT, SACRAMENTO, CA
Designed curriculum for, and facilitated all aspects of a 2-day, 8-hour professional development workshop for ELL teachers.

INVITED LECTURES

FEEDING THE LITTLE MASSES: SCHOOL FOOD IN THE 21ST CENTURY FEBRUARY 2008
MILLERSVILLE STATE UNIVERSITY, MILLERSVILLE, PA
Gave public lecture and three campus courses on the issues confronting school food and nutrition in the 21st century 'age of obesity'. Special focus on how schools should address feeding and educating immigrant children about nutrition and health.

21ST CENTURY CHILDREN, HEALTH, AND FOOD SEPT 2007
MILLS COLLEGE, OAKLAND, CA
For upper division History class ("History of Food in the U.S."), served as guest lecturer on children's health issues and how current federal and state policies in schools aim to combat child obesity.

CHILDREN AND HEALTH IN SCHOOLS 2005-2006
UNIVERSITY OF CALIFORNIA, DAVIS, CA
Served as guest speaker on wide range of topics concerning children's culture and food studies, for various upper-division undergraduate classes in American Studies, Women's Studies, and Education.

YOUTH HEALTH RESEARCH PROJECTS

IMMIGRANT CHILDREN IN SCHOOL CAFETERIAS 2004-2006
UNIVERSITY OF CALIFORNIA, DAVIS, SCHOOL OF EDUCATION
Planned and conducted independent ethnographic research project in Sacramento area elementary school serving large numbers of immigrant children. Collected qualitative data on how immigrant children and their families are affected by school cafeteria food and nutrition education in American schools. Developed and instructed culturally appropriate nutrition science lessons.

PHOTO STUDY ASSESSMENT OF FARM-TO-CAFETERIA PROJECTS 2003-2004
SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION PROGRAM (SAREP), UC DAVIS, CA
PRINCIPAL INVESTIGATOR: DR. GAIL FEENSTRA

Photographed and cataloged digital pictures of over 800 student assembled school lunches in nine area schools as part of evaluation of School-to-Cafeteria self-serve salad bar lunch program in Yolo County, CA. Analyzed images for nutritional content, interviewed 15 staff and students to provide supporting qualitative data to explain student choices and activities regarding their use of salad bar program. Compiled qualitative data into summative report for grant evaluation.

SOY-BASED DIET TO PREVENT OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN 2003-2004
WESTERN HEALTH NUTRITION RESEARCH CENTER, USDA
PRINCIPAL INVESTIGATOR: DR. MARTA VAN LOAN
Served as radiologic operator on multi-state study to assess bone health of postmenopausal women using Dual X-Ray Absorptiometry (DXA) methods.

BONE HEALTH & CALCIUM INTAKE OF PREADOLESCENT GIRLS 2001-2003
PURDUE UNIVERSITY & UNIVERSITY OF CALIFORNIA, DAVIS
PRINCIPAL INVESTIGATORS: DRS. CHRISTINE BRUHN, MARTA VAN LOAN

As part of research team, recruited 123 Asian and Hispanic origin preadolescent girls and families for two-year dietary and bone health assessment study. Measured bone composition, size, dietary attitudes, calcium intake, and acculturation status of subjects. Taught computer-based, culturally relevant calcium education pilot program in four Sacramento area schools.

GRANT WRITING

DOCUMENTARY STUDIES RESEARCH INTEREST GROUP AT UC DAVIS 2006
Wrote $1500 proposal to start an interdisciplinary faculty-student research group to support use of documentary methodologies such as film, video, radio, and photography to study California youth. Grant was funded by the Consortium for Women and Research at UC Davis.

ROBERT WOOD JOHNSON FOUNDATION: HEALTHY EATING EVIDENCE TO PREVENT CHILDHOOD OBESITY
2006
Primary writer for $400,000 multi-year grant proposal teaming UC Davis nutrition, agricultural economics, and education departments to study changes in children's fruit and vegetable consumption as well as the economic sustainability of California school foodservice as a result of federal school nutrition policy changes. Proposal went to final round.

SACRAMENTO START AFTERSCHOOL FOOD & ACTIVITY PROGRAM 2005
Assisted in writing an AmeriCorps grant proposal to fund the implementation of after school fresh fruit and vegetable and physical education programs in six Sacramento area school districts.

UC DAVIS BIOREGIONAL STUDIES GRANT PROGRAM 2003
Co-wrote successful $3,000 grant proposal to study immigrant youth and families in the West Sacramento bioregion, particularly how the use of school community gardens contributed to the food shed of this community, and affected their dietary acculturation and food security.

LEADERSHIP & SERVICE

Within UC Davis School of Education

- Education Graduate Student Association Co-Chair, 2004- 2006
- Education Graduate Group in Education Policy Committee Student Representative, 2004-2007
- Faculty Search Committee Student Representative Coordinator, 2005-2007
- Student Representative to Education Partners Organization, Fall 2004

Within UC Davis campus

- Member, Status of Women at UC Davis Administrative Advisory Committee, 2007-present
- Co-founder, Documentary Studies at UC Davis (DOCS) Research Group, 2006
- Invited Graduate Student Representative, Chancellor's Fall Retreat, UC Davis, Fall 2006

- Co-founder and co-coordinator, UC Davis Food and Culture Research Cluster (sponsored by the Davis Humanities Institute), Fall 2005- present
- Student Representative, UC Davis-wide Graduate Student Association, 2005-2007
- Invited guest speaker on women and minority graduate student professional development for various UC Davis campus program and organizations, including the Professors for the Future, the Cross Cultural Center, and the Women's Research and Resource Center, 2005-2007
- Invited guest speaker to undergraduate classes in American Studies, Women and Gender Studies, and Education, 2004-2007
- Social Chair, Food Science Graduate Student Association, Fall 2002-Spring 2003
- Student Representative, UC Davis invited visit to Wuxi, China for International Food Science Institute meeting, October 2003

Larger research community

- Area Co-Chair, Food & Culture Area of Southwest/Texas Popular Culture/American Culture Association, 2005-present
- Invitee, "100 Leaders: Mills Forum on Scholastic Achievement, Student Health and School Lunch" Symposium Coordinated by Dr. Delaine Eastin, Mills College, Oakland, CA, Sept 2007
- Leadership Advisory Board member, Center for Integrative Nutrition Environments in School Communities (CNS), UC Davis
- Peer reviewer, *Food & Foodways*, Food Anthropology Journal (Taylor & Francis) 2006-present
- Peer reviewer, *Food, Culture & Society,* Interdisciplinary Food Studies Journal (Berg Publishers), Fall 2005- present
- Graduate Student Discussant/Rapporteur, Stanford University Center for Higher Education Partnerships, Spring 2006

PROFESSIONAL REFERENCES

1. Professor Jon Wagner, UC Davis School of Education
   (510) 847-3540 jcwagner@ucdavis.edu
2. Professor Carole M. Counihan, Millersville State University, PA
   (717) 872-3575 office carole.counihan@millersville.edu
3. Denise Davila, M.A., CSU-East Bay Department of Teacher Education, Hayward, CA
   (614) 787-0265 denise.davila@csueastbay.edu

BARBARA G. DEVOLDER (nee EPSTEIN)

P.O. Box 1155
Los Alamos, New Mexico 87544
(505) 661-8799 (home phone)
(505) 667- 8928 (work phone)
bdevolder@comcast.net (home email)
bgd@lanl.gov (work email)

SUMMARY *Ph.D. in Applied Mathematics. Thesis research in mathematical modeling of Tokamak plasmas***.**

27+ years of experience in computational physics as a Technical Staff Member / Scientist at Los Alamos National Laboratory, Los Alamos, NM.

Post-doctoral appointment at Sandia National Laboratories, Albuquerque, NM.

Teaching experience in physics and mathematics at the university level at Harvard University and at the University of New Mexico – Los Alamos. Participation in mentoring and educational outreach programs at Los Alamos National Laboratory.

EDUCATION *Barnard College of Columbia University, New York, NY.*

A.B., Mathematics, summa cum laude, June 1972.
Elected to Phi Beta Kappa.

Harvard University, Cambridge, MA.

A.M., Applied Mathematics, March 1974.

Ph.D., Applied Mathematics, November 1978.

Northern New Mexico College, Espanola, NM.
Took two education classes (Foundations of Education, Reading and Writing Across the Secondary Curriculum) 2005-2006.

RESEARCH *Technical Staff Member / Scientist, Applied Physics Division,*

EXPERIENCE *Los Alamos National Laboratory, Los Alamos, NM.*

April 1981 – present.

Extensive experience in computational physics, working as a team member to support the weapons program, stock-pile stewardship, plasma physics, and other defense-related projects.

Post-doctoral appointee and Member of the Technical Staff, Plasma Theory Division, Sandia National Laboratories, Albuquerque, NM.

November 1978 – April 1981.
Research Assistant in Engineering,
The RAND Corporation, Santa Monica, CA.
Summer 1974.

TEACHING EXPERIENCE

Participant and mentor in several education programs at Los Alamos National Laboratory, including Science and Engineering Research Semester, Applied Science Proficiency program, TOPS summer program for middle-school teachers. Served as mentor for undergraduate summer students and post-doctoral employee, and as student liaison for Applied Physics Division. Service extends from 1988 to present.

Volunteer GED Math Tutor at the University of New Mexico, Los Alamos, NM, 2006.

Adjunct Instructor at the Graduate Center,

University of New Mexico, Los Alamos, NM.

Taught upper level mathematics classes (advanced calculus and ordinary differential equations), 1987 – 1988.

Tutor in engineering mathematics course, Sandia National Laboratories, Albuquerque, NM, 1979.

Teaching Fellow in Physics, Harvard University, Cambridge, MA, 1973 – 1976. Taught undergraduates and adult students (Harvard Extension program).
Awarded White Prize for excellence in teaching physics, 1975.
Resident Tutor in Applied Mathematics and Physics, Lowell House, Harvard University, Cambridge, MA, 1973 – 1975.

Resumé
Catherine Martínez Berryhill

921 Paseo de Oñate, Española, New Mexico 87532
505-747-2194 cathyb@nnmc.edu

Education

High School Diploma, Espanola High School, Espanola, NM, 1967
B. S. Secondary Education, History/English, New Mexico State University, Las Cruces, NM, 1972
Bilingual Education Endorsement, University of New Mexico, Albuquerque, NM, 1986-87
M.S. Secondary Education, Technology, University of New Mexico, Albuquerque, NM, 1998
Ph.D. Curriculum and Instruction, New Mexico State University, Las Cruces New Mexico, 2006

Professional Experience

Dean, College of Education, Northern New Mexico College, Espanola, New Mexico, 2007-Presesnt.

My position as Dean requires oversight of several education programs including: BA in Elementary Education, AA in Early Childhood Education, AA in Elementary Education and certification in Alternative Licensure. The entire department, including full and adjunct faculty, secretarial support, program advisors and coordinators are my responsibility.

The team works to develop collaborative projects with entities both within the college and in the regional education community including school districts, state councils, the New Mexico Public Education Department and the New Mexico Higher Education Department. Curriculum, evaluation, gathering, aggregating, and analyzing data to implement programmatic changes and accreditation issues are dealt with by the Office of the Dean.

Science Education Specialist, Northern New Mexico Math and Science Academy, Los Alamos National Laboratory, 2001- 2007

I work in a small team of three peers to provide comprehensive professional development for teachers in the areas of math, science and technology in northern New Mexico. This three year, standards-based program includes Summer Institutes where I teach pedagogy, classroom management, information and learning technology, learning and brain theory, teacher professional collaboration, instructional strategies and student motivation.

I am a program developer for Math and Science Academy, a role that requires diplomacy, working with district personnel and teachers, working as a team member and relationship building among several groups. This team environment requires initiative, creativity and resourcefulness. Initial and ongoing liaison with district administrators is essential for programmatic success.

I regularly report on the effectiveness and mission of the program to entities that fund us including the NM Legislature, private business, and to our external evaluator, the University of California CRESST. I provide cognitive coaching and informal and formal observations for teachers during the school year. I work in a team environment that requires initiative, creativity and resourcefulness.

The achievements of Math and Science Academy are known throughout the region, not only in the five school districts—Mora, Espanola, Chama, Taos and Pojoaque.

I worked with the New Mexico Public Education Department to develop the Three Tier Teacher Licensure Program.

Math and Science Academy has gained recognition through involvement with the National Science Resource Council, Senator Jeff Bingaman's Science Outreach initiatives, and similar programs at other national laboratories. The Math and Science Academy Team was recognized by Loa Alamos National Laboratory as an Outstanding Small Team in 2005.

I helped develop, implement and teach in the Masters of Arts in Teaching Math and Science, a partnership with New Mexico State University that presently has cohorts of 52 teachers from northern New Mexico. The first class is due to graduate in December, 2007.

Coordinator: Northern New Mexico College, Espanola, New Mexico. Various coordinator positions, all grant driven and state or federally funded, requiring grant writing and reporting, 1996-2001:

Regional Educational Technology Assistance, Regional Resource Center, RETA:
I wrote the grant that obtained this program for the College. I recruited and taught technology classes to area teachers who wanted to improve their technology skills and integrate learning technologies into the curriculum. I worked with a staff team to write this grant and develop the program. I developed and taught a program to train teachers on the use of interactive television distance education. I initiated the Tech Expo program that affords the opportunity for teachers to showcase their learning in an expo environment.

Collaboration for Excellence in Teacher Preparation:
This program developed teachers in the areas of math and science. I recruited and screened students for scholarships and workshops associated with this grant, and reported to the funding agency, the National Science Foundation through New Mexico State University. I developed courses, recruited instructors and coordinated science and math workshops for area teachers. I also advised students in the Alternative Education Program and the Northern/Highlands 3+1 Program.

Carl Perkins Educational Grant, Articulation Component:
I worked with area administrators to articulate high school vocational classes with college classes so that students can attend classes concurrently. I served on the articulation committee of the Commission on Higher Education, as institutions of higher learning throughout the state articulated a core curriculum.

Activity II Title III Grant, Student Success Center:
I developed and implemented a successful computer lab and tutoring center for students at the college. This program was developed using Title III funds, and I was responsible for

reporting on the achievements and progress of the program. The program saw a tremendous increase in usage by students and has impacted the success rate of students who attend the college.

Adjunct Faculty, Post Secondary Education:

As adjunct faculty, I have developed courses, developed syllabi and worked on curriculum construction for education departments, especially at Northern. I also helped to develop a Master's program through New Mexico State University.

New Mexico Highlands University, 1998-Present. Principles of Curriculum Construction, Computer Applications for Educators, Teaching Methods for Science and Social Studies, Field-Based Experience II, Graduate and Undergraduate levels

Northern New Mexico College, 1985-Present. Remedial Math, Remedial Reading, Foundations of Education, Multicultural Education, Reading and Writing Across the Curriculum, Methods and Materials for the Secondary Classroom, Technology for Teachers, Field Based Experience I and II

New Mexico State University, 1998-Present. Technology for the Classroom, Preparation of the Professional Development Dossier, Foundations of Curriculum, Curriculum and Pedagogy, Action Research, Aligning Teaching, Assessment and NM Standards, Graduate and Undergraduate levels

Classroom Teacher

Peñasco Jr/Sr High School, 1989-1994
Little Blessings Child Care Center, Owner and Teacher, 1983-1991
Santa Fe Public Schools, The Alternative High School, 1980-1985.
Alto Street Kindergarten, 1979-1980

Professional Development

ASCD Evaluating Professional Development Institute, May, 2002 (Albuquerque)

ASCD Teaching and Learning Conference, October 2001 (Atlanta), October 2002 (New Orleans), October 2003 (Philadelphia)

The Brain and Learning Conference, November 2005 (Boston)

A Framework for Understanding Poverty, December, 2005 (Galveston, TX)

Certified Trainer

National American Indian Educators Conference, (Seattle) 1999

National Science Resource Council Conference, (Santa Fe) 2007

Professional and Organizational Development in Higher Education, (Philadelphia) 2007

New Teacher Center, (San Jose) 2008

Presentations

Reading and Writing Across the Curriculum, Professional Development for Espanola Valley High School Faculty, January 2009

New Mexico State Legislature, Science Professional Development Bill, 2003, 2004, 2005, 2006, 2007 includes presentations to the Legislative Education Study Committee and the LANL Oversight Committee

Teaching for Success- Working with Students from Poverty, Spring, 2006, Rio Arriba Juvenile Justice Department

Effective Classroom Management, Espanola Public Schools, Spring 2007

Using Successful Strategies in the Classroom, McCurdy Schools, Spring 2007

Classroom Observations for Principals, Espanola Public Schools, Fall 2005-Fall, 2008

Professional Development Workshops, College of Engineering, NNMC Fall/Spring, 2008-09

Reading Across the Curriculum, Espanola Public Schools, Spring 2009

Faculty Development Workshops, NNMC, Spring 2009

Awards

Los Alamos National Laboratory Foundation, President's Award 2002

Los Alamos National Laboratory, Director's Award, Outstanding Small Team, 2005

Board Member

Family Learning Center, Española, NM 1988-1999 and 2005-present

John Hyson Educational Center, Chimayo, NM 1989-1999

References

Susan Herrera	Dr. Lorenzo Gonzales	Dr. Karin Wiburg
Exec. Dir. LANL Foundation	Los Alamos National Laboratory	New Mexico State University
505-753-8890	***505-699-4050***	***505-646-1407***

VITAE

Lorenzo Gonzales, Ph.D.

Math and Science Academy

Los Alamos National Laboratory
Work: (505) 699-4050
Home: (505) 289-3363
snlogonz@hotmail.com

Professional Profile

Dr. Lorenzo Gonzales, a professional staff developer with the Northern New Mexico Math and Science Academy, Los Alamos National Laboratory, is a recognized master teacher. He has years of experience as a New Mexico K-12 educator and teacher professional development specialist with Santa Fe Community College and Northern New Mexico College. Dr. Gonzales is also an innovative teacher honored by state and national organizations for his leadership in classroom technology integration, devotion to education, and expertise in teaching science. He holds an earned doctorate in curriculum and instruction from New Mexico State University, 2004.

Academic Background

1966-1970 Eastern New Mexico University Portales, New Mexico
B.A. Biology and Earth Science, GPA: 3.2.

1970-72 Eastern New Mexico University Portales, New Mexico
Graduate studies in Zoology, GPA: 3.5.
Reserve Officer Training Corps, 1st Lt. U.S. Army

1973-1976 Twenty eight graduate hours towards administration certificate

1979-83 University of New Mexico Albuquerque, NM

M.A. Secondary Education with emphasis on Reading, GPA: 3.9.

1996-98 University of New Mexico Albuquerque, NM
Ed. Sp. Curriculum and Instruction with emphasis in technology, GPA: 3.9.

1999-2004 Ph.D. Cohort Program in Curriculum and Instruction from New Mexico State University, GPA: 4.0.

Dissertation Topic "Building Personal Knowledge of Rational Numbers through the Development of Mental Images, Concepts, Facts, Language, and Procedures"

The purpose of this study is twofold: 1) to examine the representational constructs learners need for the successful computation of dividing rational numbers, and 2) to develop a conceptual and instructional framework within which the learner can more intuitively understand the concept of dividing a fraction by a fraction.

Professional Licenses/Certifications I am a licensed New Mexico teacher with teaching certifications in: Biology, Geology, General Science, K-12 Reading and Educational Leadership, and Administrative Certificate.

Academic/Teaching Experience ence and Reading Classroom Teacher, Cuba Independent Schools, Cuba, New Mexico

l Accessing Computers in Education (ACE) Master Teacher

CE Project was an Intel/Microsoft/HP national pilot effort to help teachers integrate technology into instruction and enhance student learning. As a master teacher I was part of a New Mexico training cadre that provided extensive training and resources to teachers to promote effective technology use in the classroom.

1996-present Regional Educational Technology Assistance (RETA) Instructor

I am part of a state-wide team of classroom teacher who conduct professional development and instruction for pre-service and in-service staff as well as professional development of school administrators. I have developed and lead scores of full-day workshop to K-12 in-service and pre-service school staff in the integration of learning technologies in the classroom.

1999-2003 RETA/SFCC Regional Resource Center Site Coordinator

I coordinated a regional resource center whose goal is to instruct teachers and administrators in the use of computers and technology in the classroom. I build district capacity and development of staff at the building level; they in turn conduct staff training of school unit staff. The program consists of modules in mathematics, statistics,

creativity, visual thinking, hypertext markup language (html), and cognition.

2000-2002 RETA/ENMU Walk-The-Talk Professional Development Cadre

As part of an Eastern New Mexico training cadre, I conducted professional development and instruction in the integration of technology in the classroom to Eastern New Mexico teachers.

2000-2002 MCIWorldCom Foundation National Training Cadre

Conducted standards-based Internet content and professional development to K-12 teachers throughout the United States as well as to teachers at the local, state, and regional level.

2002-03MCIWorldCom Foundation National Distance Learning Cadre

2002-03New Mexico State MathStar Lesson Study Field Facilitator

2003-2008 RETA Distance Learning Instructors

Instruct and facilitate distance learning courses via the Internet to New Mexico classroom teachers in Technology Essentials, Web Design, and Facilitation of Online Learning.

2003-present Math and Science Academy staff developer. Develop and deliver researched based professional development programs to northern New Mexico teachers and administrators in mathematics, technology integration and data collection and analysis.

2004-present Northern New Mexico Community College Instructor, Education 312 & 422 – Math for Elementary Teachers. Developed Mathematics Foundation courses for pre-service teachers.

2005 – DOE Education Programs Conference

Technical and Specialized Skills

Specifically trained as DIEBELs instructor for online reading assessment program, instructing K-3 teachers to use online and PDA's to assess students' reading comprehension.

Other Experience

Sandoval County Commissioner

La Jara, New Mexico Domestic Water Association President

Cuba, New Mexico Recreation Director

Professional and Academic Awards

1974-75 Ford Foundation Fellow traveled the contiguous United States and interned with local political action groups, K-12 school, Regional Equal Employment Agency and Mexican American Legal Defense and Educational Fund

1995 New Mexico Science and Engineering Fair Sponsor of the Year

1996 New Mexico Golden Apple Honoree

1996 New Mexico Research and Study Council Classroom Award

1997 Milken Family Foundation National Honoree

1998 MSN Encarta Featured Teacher for July-August and Primer Award Winner of Schoolhouse Lesson Contest

2005 Los Alamos National Laboratory Distinguished Performance Award, Math and Science Academy

2008 Los Alamos National Laboratory Award

2007-08 Secretary of Energy EEO & Diversity Best Practices Award

Teaching Interest

Elementary Mathematics for Elementary Teachers

Integration of Technology in The Classroom

Science for K-12 Teachers

Social Cognition and Pedagogy

Teaching Evaluations

MCIWorldCom MarcoPolo Internet Content for the Classroom (4.75)

Selected comments from participants evaluations:

- Lorenzo didn't just instructing us in the many uses of MarcoPolo, but he was also very helpful in all aspects of technology. He shared his own work so we would have a model to refer to. I really appreciated his extra help. I would enjoy a few more days of training.
- I feel that the trainer presented the material of the Marcopolo site very effectively. He showed the knowledge of years of experience.
- Very relaxed informal setting. Everyone felt comfortable exploring the sites. Lorenzo gave a great overview of the site and partner sites!

Interests

My personal and professional interests lie in mathematics and the sciences, in fact, they overlap; I am a home winemaker and I also have great interest in cognition and creativity as they apply to my professional and personal lives. For instance, I have taken many drawing and painting classes at Santa Fe Community College and Northern New Mexico Community College

Northern New Mexico College (NNMC):

Interim Exec. VP, Finance & Admin.*(2009-present),* **Associate Provost – Research & Graduate Studies,** *(2008-present);*
Dean, College of Engineering *(2008-9);*
Chair – Computer & Engineering Technology Dept, *2007-8;*

University of New Mexico (UNM)

Research Professor, School of Engineering, *University of New Mexico, 2007-present.*
Former Professor & PNM Chair in Microsystems, Commercialization and Technology; *University of New Mexico: School of Engineering, UNM Anderson Schools of Management, 2002-7;*

Academic Degrees with fields, institution, and date:

MBA, Bus. Admin. **Heriot-Watt University, Edinburgh, U.K**. 1998 (Edinburgh Bus. School)
Ph.D,. Elect. Engineering **Michigan State University** 1967 (NSF Graduate Scholarship)
MSEE, Elect. Engineering **University of New Mexico** 1965 (NSF Graduate Scholarship)
BSEE, Elect. Engineering **University of New Mexico (with Distinction)** 1964
BA, Math (English minor) **University of New Mexico (with Distinction)** 1964

Industrial Experience *(34 yrs total, 22 yrs management, 17 yrs as company officer)*

1984 – present **Suntek Industries**; Santa Fe, NM. **Founder** of management consulting company. Clients include AT&T Bell Labs, Integrated Network Corp., Mixbaal, S.A. de C. V. (Mexico City); Asurent Wireless, Inc; The Prediction Company
1994-2002 **Digital Transmission Systems, Inc (DTS)**, Duluth, GA. **CEO** of public holding company with several subsidiaries, all in manufacture or sale of telecom equipment; (2001 sales $50M, 115 emp.)
1991-1994 **AT&T Paradyne Corp**., Largo, FL. **VP, CTO of Corporation**, a manufacturer of datacom and telecom equipment. (1994 Sales $500M, 2200 emp.)
1989-1991 **TyLink Corp**., Norwood, MA. **Sr.VP Operations, Engineering & Service**. Manufacturer of datacom and telecom equipment (1991 Sales $8M, 32 emp.).
1984-1989 **Infinet, Inc**., North Andover, MA, **VP Engineering**. Manufacturer of telecom equipment (1988 sales $45M, 130 emp.)
1976-1984 **AT&T Bell Labs**, Holmdel, NJ. , **Specialist**, **Supervisor**, workstations, protocols development.
1975-1976 **United Nations**; **Telecom ITU Expert**, training in Geneva, Switzerland, assigned *to Secretaria de Comunicaciones y Transportes*, Mexico City. (teaching and consulting duties)
1967-1975 **AT&T Bell Labs**, Holmdel, NJ. **Member of Technical Staff**, Specialist in communications research and development.

Honors, Scientific and professional societies:

Senior Member, 1961-*The Institute of Electrical and Electronics Engineers*
Local Arrangements Chairman - ***Seventh Data Communications Symposium,*** Mexico City, October 1981, sponsored by IEEE Computer Society and ACM.
Registration Chairman - ***Eighth Data Communications Symposium***, North Falmouth, Massachusetts, October 1983, sponsored by IEEE Computer Society and ACM.
Chairman, Southeast Region, 1998-1999 *American Electronics Association*
Distinguished Engineering Alumnus, 2002, School of Engineering, *University of New Mexico*

Summary of Activities at NNMC August 2007-Present

Teaching & Curriculum Development:

- Instructor of courses in NNMC College of Engineering (COEG) (electrical and computer engineering – ECE – and mechanical engineering – ME – and IT – information technology and SMET – STEM orientation course for high school concurrent students) and Department of Business Administration (international business, ethics & business);
- Developed three new Bachelor's degree programs – Information Engineering Technology, Mechanical Engineering with Solar Emphasis, Software Engineering; (Approved by HED and HLC accrediting agencies)
- Developed two new Master's degree programs – Information Engineering Technology, Mechanical Engineering with Solar Emphasis (both under review by HED and HLC)

Research:

- Published 4 peer-reviewed *business* journal or conference articles for IABE journals.
- Published 5 monographs on research in solar engineering related topics conducted for UNM/PNM and NNMC SERPA.

Grants:

- As Co-PI and Director of STEM Programs in COEG received NSF STEP contract award totaling nearly $300K with $200K aggregate extension possible in years 4 and 5.
- Together with NNMC President led the NNMC- wide initiative for the establishment of Solar Energy Research Park and Academy (SERPA) with $3 million grant from 48th NM Legislature.
- In second year inherited MSEIP Grant of $500K over a three year period as Director.

Campus Service & Administration:

- 2007-8 Member of Campus-wide faculty committees on senate formation and tenure.
- Member of Committee on Retention, Assessment, Curriculum, Staff Association;
- Recruited four new faculty members to College of Engineering 2007-8.
- Member of SOE Recruitment Committee for ME Dept Chair and ECE professor in Microsystems (2004).
- As Vice Provost promoted the development of Master's Degree proposals at NNMC, attended NM Council of Deans meetings, advocated and reviewed research proposals from STEM faculty;
- Co-organized (with Cathy Berryhill) First STEM Educators Symposium (SES)- April 2009; Attendees from high school STEM instructors and NNMC STEM faculty; Funded by MSEIP grant

Community Service:

- Co-Founder of *High Desert Venture Camp* – An Entrepreneurship Conference for students, faculty and community members, held 2005, 2006, 2007 and 2008.
- Member of regional economic development organizations –Regional Development Corp. (board member – 2002-9);
- Member of NNMC Foundation, non-profit formed to manage and grow endowment.(2008-present), Chair of Fundraising Committee (2009-present);
- Organizer of SERPA Community Seminars – A monthly series of talks on solar energy or smart grid. (2008-9)
- Member of Espanola Downtown Improvement Committee – Task force commissioned to develop plan for downtown development.

Student Service:

- Faculty advisor to all students in engineering. (2007-8)
- Faculty advisor to COEG seniors;(2008-9);
- Director, STEM Programs – MSEIP & ASPIRe (2007-present);

- Organizer of inaugural College of Engineering Graduation Ceremony – May 2009.

Andres C. Salazar, PhD

Summary of Activities at UNM August 2002-August 2007

Teaching:

- Taught 18 courses in UNM School of Engineering (SOE) (electrical and computer engineering – ECE – and mechanical engineering – ME – departments) and Anderson Schools of Management (ASM) over the 10 semester period since being hired at UNM (cumulative over 1,250 student credit hours).
- Taught upper division level ECE and ME courses
- Taught 2 new courses at ASM. (Project/Program Management and Tech Transfer – Asia/USA)
- Spearheaded approval of 3-2 MBA and double master's programs for Electrical and Computer Engineering (ECE) students at both SOE and ASM

Research:

- Published 16 peer-reviewed *business* journal or conference articles for NBES, AGB, USASBE, IABE and Mountain Plains Business Conferences.(All papers and talks while at UNM)
- Published 21 peer-reviewed *engineering* journal or conference articles in IEEE or other engineering publications. (pre 2002. All papers published while at Bell Labs)
- Published 33 industrial monographs.(pre 2002) All monographs published while at Bell Labs)

Grants:

- Received 7 contract awards totaling over $200K for the Center on Entrepreneurship and Innovation (CEI) including 2 from the Kauffman Foundation, NCIIA, SATOP and LANL, PNM and Mission Research(AFRL contract).
- Led the UNM- wide initiative for the National Collegiate Entrepreneurship Initiative from Kauffman Foundation (2003), awarded $50K planning grant.

Campus Service:

- Member of Campus-wide faculty committees on "Environment Scanning," "Areas of Marked Distinction," and "Standing Committee on Intellectual Property." (2002-5)
- Member of Prince of Asturias Endowment Committee(2004-present);
- Member of ASM Curriculum and Programs Committee (2003-5);
- Member of SOE Recruitment Committee for ME Dept Chair and ECE professor in Microsystems (2004).

Community Service:

- Co-Founder of *High Desert Venture Camp* – An Entrepreneurship Conference for students, faculty and community members, held 2005, 2006.
- Member of regional economic development organizations – NextGen (advisory board 2004-present) and Regional Development Corp. (board member – 2002-present);
- Adjunct staff member of NM State Dept of Economic Development – 2004-5 - Operations Chair of Microsystems/Nanotechnology Partnership (MiNaTeP)

Student Service:

- Faculty advisor to Students for Economic Development Club (2004, 2005);
- Faculty advisor to Collegiate Entrepreneurship Club(2005-7);

Publications in teaching or research – 42 total professional peer-reviewed journal or conference papers and 40 academic/industrial monographs, 1 edited book, 1 patent.

JOURNAL ARTICLES IN BUSINESS, MANAGEMENT & PUBLIC POLICY (9)

Salazar, Andres C. and Kumar, Girish. (2004) *Business Creation and Commercialization of Technology at a University: In Search of the Holy Grail.* **Review of Business Research**, Vol II, No. 1, pp 76-82.

Salazar, Andres C. (2005) *Modern Strategy and Contract Issues in Technology Between Firms in Licensing of Technology.* **International Journal of Business Research,** Vol. 2, No. 1, pp 145-151**.**

Salazar, Andres C. (2006) *Albuquerque: City of Contrasts.* **Canadian Journal of Regional Science**, Vol XXVIII, No. 2, pp265-281.

Salazar, Andres C. (2006) *Economic Development at a Public University- A Process Model and Associated Metrics.* **Review of Business Research**. Vol VI, No. 4, pp133-142,

Salazar, Andres C. (2006) *The Budget Battleground at a Public University.* **Journal of Applied Business and Economics**, Vol 6, No. 2, pp42-53.

Salazar, Andres C. (2007) *Innovation and National Economic Strategy*. **International Journal of Business Strategy**, Vol. 7, No. 2, pp198-205.

Salazar, Andres C. (2008) *Innovation and Engineering School Ranking*. **Review for Business Research**, (Conference presentation on October 2008), publication in October 2009.

Salazar, Andres C. (2009) *Anti-donation Clause – Time to Delete?,* **Review for Business Research,** publication in October 2009.

Salazar, Andres C. (2009) *Seven Deadly Factors Associated with Technology Company Failure,* **European Journal of Management,** publication in October 2009.

CONFERENCE PAPERS IN BUSINESS, MANAGEMENT & PUBLIC POLICY (11)

Salazar, Andres C. (2003), *Supplementing Engineering Education with Business Training.* **Proceedings of Teaching Entrepreneurship to Engineering Students Conference**, Monterrey, CA, January 12-16, 2003. pp 237-241.

Salazar, Andres C. (2003), *Is Independence an Extinct Virtue on Boards?*, **Albuquerque Journal,** (Business Outlook Supplement, p. 7), January 16, 2003.

Salazar, Andres C. (2003) *Role of the University in MEMS Development,* **Proc. Of First MEMS Conference in Mexico**, Puerto Vallarta, Mexico, October 17-19, 2003. (Talk delivered in Spanish).

Salazar, Andres C. (2004) *In Defense of Economic Development at a Public University.* **Proceedings of Mountain Plains Business Conference**, Grand Junction, CO, October 13, 2004. (electronic proceedings)

Salazar, Andres C. (2004) *Modern Challenges of New Business Creation & Entrepreneurship in Rural Areas;* **Association of Global Business Conference**, Cancun, Mexico, November 18, 2004.

Salazar, Andres C. (2005) *Board Member Selection in New Technology Businesses.* (2005) **Proceedings of USASBE/SBI Conference**, Indian Wells, CA, January 13, 2005. p 61 (abstract).

Salazar, Andres C. (2005) *MiNaTeP in New Mexico – A Micro/Nano Initiative in Economic Development.* **BioMEMS Conference, Monterrey, Mexico,** March 4-5, 2005. (abstract only) (Talk delivered in Spanish).

Salazar, Andres C. (2005) *The Budget Battleground at a Public University.* **National Business and Economics Society Conference,** Key West, FL, March 13, 2005.

Salazar, Andres C. (2006) *Study of Failure of High Technology Firms Through Near-Death Experience*. Proceedings of **US Association of Small Business and Entrepreneurship Conference**, Tucson, AZ, January 13, 2006.

Salazar, Andres C. (2006) *Poverty and Prosperity in the Rocky Mountain States- A Parametric and Statistical Analysis.* Proceedings of the **National Business and Economics Society Conference**, Los Cabos, Mexico, March 10, 2006.

Salazar, Andres C. (2007) *Opportunities for Rural Economic Development,* **International Business and Finance Research Conference,** South Padre Island, TX, January 4-6. 2007.

CONFERENCE PAPERS IN EDUCATION & EDUCATIONAL POLICY (1)

Salazar, Andres C. (2009) *Holistic Approach to STEM Programs for Hispanics*, **Southwest Title V Best Practices Conference,** San Jose, CA, March 12, 2009. (invited talk, non-peer reviewed)

GRADUATE THESIS ADVISEMENT IN ENGINEERING (2)

Pasos, Rudolfo, Maestria de Ingenieria, Centro de Investigacion y Estudios Avanzados, ***Instituto Politecnico de Mexico***, 1976

Bobadilla, Roberto, Maestria de Ingenieria, Centro de Investigacion y Estudios Avanzados, ***Instituto Politecnico de Mexico***, 1976

JOURNAL ARTICLES IN ENGINEERING (10)

Brophy, F. & Salazar, A. (1973) *Considerations of the Pade Approximant Technique in the Synthesis of Recursive Digital Filters*, **IEEE Trans. on Audio and Electroacoustics**, Dec. 1973.

Foschini, G., Smith, J & Salazar, A. (1974) A. *Markov Process Analysis of PCM Line Monitors,* **IEEE Trans. on Communications,** Feb. 1974.

Brophy, F. & Salazar, A. (1974)*Recursive Digital Filter Sysnthesis in the Time Domain*, **IEEE Trans. on Audio and Electroacoustics**, Feb. 1974.

Salazar, A. (1974) *Design of Transmitter and Receiver Filters for Decision Feedback Equalization*, **Bell System Technical Journal,** Mar. 1974.

Foschini, F. & Salazar, A. (1975) *Data Pulse Design - Realizability Considerations***, Journal of the Institute of Mathematics and Its Applications**, April 1975.

Brophy, F. & Salazar, A. (1975) *Synthesis of Spectrum Shaping Digital Filters of Recursive Design*, **IEEE Trans. on Circuits and Systems**, Mar. 1975.

Brophy, F. & Salazar, A. (1975) *Two Design Techniques for Digital Phase Networks*, **Bell System Technical Journal**, April 1975.

Guthery, S. & Salazar, A. (1975) *Statistical Methods for Determining Quality of Communication Channels*, **IEEE Trans. on Communications**, Jun. 1975.

Lawrence, V. & Salazar, A. (1980) *Finite Precision Design of Linear Phase FIR Filters*, **Bell System Technical Journal**, 59:1575-1598, No. 9, November 1980.

Salazar, A., Scarfo, P. & Horn, R. (1987) *Network Management Systems for Data Communications***, IEEE Communications Magazine**, August 1987.

BOOK (1)

*Digital Signal Computers and Processors***,** (Salazar, A., editor), an **IEEE Press Book**, 1977c.

CONFERENCE TALKS IN ENGINEERING (12)

Foschini, G., Smith, J. & Salazar, A. (1973) *Markov Process Analysis of PCM Line Monitors*, **International Conference on Communications, Seattle, WA**., June 11, 1973.

Brophy, F. & Salazar, A. (1973) *Recursive Digital Filter Synthesis in the Time Domain***, Nat'l Telecom Conference, Atlanta, GA.**, November 28, 1973.

Brophy, F. & Salazar, A. (1973) *Synthesis of Sprectrum Shaping Digital Filters of Recursive Design***, Arden House Symposium on Digital Filtering**, Harriman, NY, Jan. 14, 1974.

Foschini, F. & Salazar, A. (1974) *Data Pulse Shaping Networks*, **International Symposium on Circuits and Systems**, San Franscisco, CA, April 25, 1974.

Guthery, S. & Salazar, A. (1974) *Statistical Methods for Determining Quality of Communcation Channels***, Nat'l Telecom Conference**, San Diego, CA, April 25, 1974.

Brophy, F. & Salazar, A. (1974) *Two Design Techniques for Digital Phase Networks***, Nat'l Telecom Conference**, San Diego, CA, Dec. 2, 1974.

Salazar, A., Sherman, D., Verma, S. & Werner, J. (1974) *Implementation of Voiceband Modems on a Digital Signal Processor*, **Nat'l Telecom Conference**, New Orleans, LA, Dec. 1975.

Salazar, A. (1978) *System Planning for Digital Signal Processors*, **National Electronics Conference**, Chicago, IL, Oct. 1978.

Salazar, A. (1979) *Effects of Finite Coefficient Precision on FIR Filter Spectra***, Int'l Conf. on Acoustics, Speech and Signal Processing,** Washington, DC, April 1979.

Lawrence, V. & Salazar, A. (1980) *Design of FIR Filters with Finite Coefficient Precision***, International Conference on Communications**, Paris, France, April 1980

Lawrence, V. & Salazar, A. (1982) *Design and Implementation of Transmitter and Receiver Filters with Periodic Coefficient Nulls for Digital Systems*, **International Conference on Acoustics, Speech and Signal Processing,** Paris, France, May 1982.

Salazar, A. (1997) *Managing and Deploying High Speed Connections in PCS Networks*, **Communications Networks Conference**, Vancouver, B.C., June 1997.

INDUSTRIAL/ACADEMIC MONOGRAPHS IN ENGINEERING (7 + 33 Bell Labs)

Fujimoto, Toshi, Antoun, Nicolas and Salazar, Andres C., *Vehicle Battery Technology – Players, Trends and Effects on PHEV Development and the Power Grid*. A Research Report sponsored by PNM Resources under contract with University of New Mexico, January 2006.

Salazar, Andres C., *Energy Storage Technology Roadmap & Solar PV Analysis.* A Study Conducted for PNM Resources Under a Research Contract with University of New Mexico, January 21, 2008.

Salazar, Andres C., *Solar Engineering Research Park & Academy (SERPA) – An Overview*. Northern New Mexico College SERPA Research Report 2008-01, July 1, 2008.

Salazar, Andres C., *Advent of the Plug-In Electric Vehicle and the Resultant Electricity Demand in New Mexico's Rio Grande Corridor;* Northern New Mexico College SERPA Report 2008-2, October 1, 2008.

Salazar, Andres C., *Solar Radiation at Double Eagle Airport – Albuquerque; Fifteen Year Statistics 1991-2005Analysis of Data from the Solar*

Radiation Data Base (SRDB); Northern New Mexico College SERPA Research Report 2008-3, December 28, 2008.

Shi, Feng and Salazar, Andres C., *Photonic Crystal Enabled Integrated Circuitry Photovoltaics: Ultra-high Conversion Efficiency at Low Cost Design.* Northern New Mexico College SERPA Research Report 2009-1, January 15, 2009.

Shi, Feng and Salazar, Andres C., *Photonic Crystal Fiber Solar Spectrum Splitter*; Northern New Mexico College SERPA Research Report 2009-2, February 1, 2009.

INDUSTRIAL EXPERIENCE

Feb. 2002 to present **SUNTEK INDUSTRIES, INC**., Santa Fe, NM;

President

- Business consultant to corporate strategy, operations planning, market assessment, organizational structure and mergers and acquisitions.
- Clients served include *AT&T Bell Laboratories, AT&T Paradyne, Integrated Network Corporation, Asurent Wireless, Mixbaal, and Prediction Company.*

1994 to Jan 2002 **DIGITAL TRANSMISSION SYSTEMS, INC.,** a public company (DTSX: NASDAQ then OTC), Duluth, GA; FY2001 rev. $48M;
Chief Executive Officer.

- Responsible for strategy and business concept first developed in 1994 of designing and marketing T1/E1 network access and sub-aggregate wireless transport products that address growing cellular and PCS markets domestically.
- Led financing of the development of spread spectrum radio products for telecom applications sold worldwide in over 40 countries.
- Rebuilt management team including marketing and sales, re-engineered corporate structure with new ERP system for finance, manufacturing, and instituted quality programs with ISO 9001 certification in December 1994.
- Led micro-cap IPO with NASDAQ listing by NYC investment banker firm. Road show included stops in New York City, Boston, San Francisco and Orange County.
- Headed up M&A and investment activity (8 transactions in 8 yrs); acted as company liaison officer to investors, analysts and shareholders.
- Submitted annual business plans and monthly operations reports to investor-led Board; since 1996 edited all 10K, 10Q, proxy SEC filings.
- Company honored with "Georgia Top 100" Award in 2000 for public companies by Atlanta Journal-Constitution, the city's major newspaper.
- For a major investor, Wi-LAN, Inc., started up US based subsidiary, Wi-LAN Wireless Data Communications, Inc.,(WWDC) focused on intellectual property development in OFDM technology. As President of WWDC, acted as liaison to Yamacraw economic development program in Georgia.

1999-2000 **MICROTEL**, Ontario, CA FY1999 rev $40M (duties concurrent with DTS employment)

Group Vice President

- For major investor in DTS, responsible for strategic management of 3 telecom subsidiaries of Microtel, a public holding company of seven subsidiaries.
- Supervised the management restructuring of a Silicon Valley telecom equipment subsidiary.
- Headed up Strategic Planning for Microtel during 1999 year.

1991-1994 **AT&T PARADYNE**,(ATTP) Largo, FL; FY1993 rev. $425M (subsidiary of AT&T),
Vice President & Chief Technical Officer

- As Business Unit General Manager, responsible for $150M business of digital modems (DDS), multiplexers, analog modems and routers. Restructured 50 member marketing and 400 member engineering departments in first six months.
- Headed up product marketing, product management and marketing research groups of company's major product lines of proprietary design – DDS, Analog modems, multiplexors and network access devices.
- Negotiated OEM contracts with *Ascend* and *Premisys*, including equity stake in latter company for re-sale of networking gear and third generation access devices.
- Initiated development of "Spinnaker" and "Geneva" product lines in network access and two-wire full duplex private line modems, projects based on approved business plans.
- Oversaw and was responsible for Bell Labs development in ADSL, ATM network switching and high-speed modem chip technology for ATTP.
- As CTO of corporation, responsible for corporate technology planning and strategy and was liaison to *AT&T* Intellectual Property Department and participated in *AT&T* Strategic Planning in Technology. As CTO, represented *AT&T Paradyne* in *AT&T Bell Laboratories Technical Officers Forum.*

1989-1991. **AVANTI COMMUNICATIONS CORP**. (later known as TyLink), Norwood, MA, FY1991 rev. $8M;
Senior VP, Operations.

- Managed hardware and UNIX/C software development of T1 products - networking and point to point multiplexers, T1 access products and high speed line drivers.
- Supervised company's factory operations in 20,000 square feet facility consisting of fully automated assembly and test, materials management and quality control.
- Responsible for full customer service profit and loss operation including systems servicing of installation, T&M and term contracts with featured 24 x 7 availability.
- Responsible for relocating company operations, including manufacturing, from Norwood, MA and Newport, RI to Norton, MA in 1991.

1984-1988. **INFINET, INC**, Memotec Group division (Canada), N. Andover, MA, 1988 rev. $40M; **VP, Engineering**

- Led the design and development of new major revenue producing modem product line that played a critical role in attracting new investment and leading the company from a loss of $14M in 1985 to a PBT of 11% at a revenue level of over $40M in 1987.

- Introduced UNIX/C for engineering development platform, change control system for software development, VLSI chip development of major modem modules, and DSP chip usage from TI and Analog Devices for equalizer implementation.
- Responsible for the technology acquisition of performance measurement product line from subsidiary in Herndon, VA.
- Formed a software consulting business unit with over $2M of awarded contracts in less than a year from Teleglobe, a long distance telephone utility also owned by Memotec.

1967-74 **AT&T BELL LABS and AT&T INFORMATION SYSTEMS**, Holmdel, NJ
1976-83 **Research Specialist, Technical Manager**

- 1982-84 Technical Manager - Unix PC/ Workstation, Communications and graphics software. Led 22 engineer team in development of GUI interface and X.25 network layer protocol for personal workstation to PBX system.
- 1980-82 Technical Manager - PBX Applications Software/communications. Led 15 engineer team in design and deployment of X.25 link and network layer protocol in adjunct minicomputer to PBX system.
- 1976-80 Specialist in Network Control and Management – Conducted research in: modem network protocols, effects of finite precision digital filters in signal design; wrote UNIX/C software for system testing and tape generation of Network Controller of DataPhone II system.
- 1967-74 Specialist in Data Transmission & Speech – Conducted research in: Speech analysis and in the processing of speech and data signals, design of recursive and nonrecursive digital filters, equalization algorithms, timing and phase recovery methods, signal shaping and high speed digital signal processor architectures.
- 1972-1983 PhD Recruiter for Bell Labs in New Mexico – Recruited six PhD graduates from University of New Mexico and New Mexico State to Bell Labs.
- 1967-1983 Published 33 technical monographs on variety of topics – including data communications, signaling, equalization, media characterization, automata, protocols.

1975-6 **UNITED NATIONS, INTERNATIONAL TELECOMMUNICATIONS UNION** – (ITU) - Geneva, Switzerland; assigned in Mexico City as Digital Communications **Expert.**

- Trained in Geneva, Switzerland to be digital communications consultant to Secretariat of Communications and Transport of Mexico.
- Trained government engineers in digital communications, wrote associated course book in Spanish, taught at local universities. Subject matter expertise included T-Carrier equipment design, digital data network planning, digital signal processing.
- Assisted in the design of a microwave network for Mexico.

Anthony Patrick Sena
407 Camino Miramontes, Española, New Mexico 87532
(505) 747-2291; Cell (505) 695-9512: Fax (505) 747-2228
asena@nnmc.edu

Degrees:

PhD, Biomedical Sciences; School of Medicine, The University of New Mexico (2000–05)
Dissertation in molecular genetics: Repair of DNA double strand breaks in the rDNA of *Saccharomyces cerevisiae*

- Graduate Program in Biology; The University of New Mexico (1974–78)
- MS, Biological Science; Eastern New Mexico University (1972–74)
- BS, Biological Science; Eastern New Mexico University (1968–72)

Professional Assignments:

- Provost - Northern New Mexico College; 2005–Present
- Chairman -Department of Math & Sciences, Northern New Mexico College; 1983–2005
- Instructor - Math and Sciences, Northern New Mexico Community College; 1981–1983
- Instructor/Chair - Science, Animas High School, Animas, New Mexico; 1979–1981
- Instructor - Programa de Biologia, Universidad Catolica de Puerto Rico; 1978–1979

Mentoring Service at Northern New Mexico College:

- Undergraduate Mentor - National Science Foundation Research Experiences (NSF-REU)
- Undergraduate Mentor - Los Alamos National Laboratory Bioscience Division (LANL-UGS)
- Undergraduate Mentor - Western Alliance to Expand Student Opportunities (ASU-WAESO)
- Undergraduate Mentor - New Mexico Alliance for Minority Participation (NM-AMP)

National Committee Participation:

- Panel Review Member, NSF-STEP Educational Directorate; 2008–09.
- Panel Review Member, NSF-REU Directorate of Biological Infrastructure; 2005–08
- Steering Committee NSF/Biotechnology Technician Training Project; 1996–99
- Undergraduate Curriculum Development Project, NSF/Georgetown University; 1992–94
- Panel Review Member, NSF-CCLI, Educational Directorate; 1991–93

Honors:

- Outstanding Graduate Presentation in Biosciences. Scientific Careers Research Symposium Los Alamos National Laboratory, Los Alamos, New Mexico - 2003
- National Community College Mentor Award. The Society for the Advancement of Chicanos and Native Americans in Science (SACNAS). Santa Cruz, California - 1999
- Faculty Excellence Award. National Institute Staff and Organizational Development (NISOD). University of Texas. - 1999
- Science Alumni Hall of Honors, ENMU - 1997
- Eminent Scholar Recognition, Northern New Mexico Community College, - 1991
- Faculty-of-the-Year Award. Northern New Mexico Community College - 1985; 1992; 1995
- Outstanding Educator. Animas Valley Educational Foundation. Animas, NM - 1981
- Member Sigma Xi, The Scientific Research Society of North America. UNM - 1978
- Who's Who in American Colleges and Universities. ENMU - 1974
- Outstanding Graduate in Biological Sciences. ENMU Faculty Association - 1972

Selected Contributions, Anthony Patrick Sena:

- Characterization of intrachromosomal recombination within the *Saccharomyces cerevisiae* rDNA.
(2004). Sena, A.P., Nickoloff, J.A., and Ruscetti, T. 49th Annual Meeting of the Radiation Research Society, Reno, Nevada, April 20-24, 2002

- Heritable genetic alterations in a xeroderma pigmentosum group G/Cockayne syndrome pedigree. (1997). Okinaka, Richard T.; Perez-Castro, Ana V.; Sena, Anthony; Laubscher, Kevin; Strniste, Gary F.; Park, Min S.; Hernandez, Rudy; Macinnes, Mark A.; Kraemer, Kenneth H. *Mutation Research*; Nov., 1997; 385(2): 107-114

- Advanced protocols for DNA analysis: Preparation of Biotinylated probe Lambda DNA; Southern blot analysis. (1995). With Harley Mortensen in Biotechnology: Theory and Techniques, Vol. II, (J. G. Chirikjian, ed). Jones and Bartlett Publishers, Boston. 280 pp.

- Identification of mutations within the ERCC-5 gene in a xeroderma pigmentosum group-G pedigree. (1995). Okinaka, R.T.; Perez, A; Laubscher, K; Sena, A.P.; Macinnes, M.A.; Kraemer, K.H.. *Journal of Cellular Biochemistry*; March 10, 1995; suppl.21A, p.285

- Evidence for mutations within the ERCC-5 gene in xeroderma-pigmentosum group-G patients. (1993). Okinaka, R; Laubscher, K; Sena, A.; American Journal of Human Genetics; 53(3): 340

- A giant land tortoise of the genus Geochelone (Testudines: Testudinidae) from the Pojoaque Member (Miocene) of the Santa Fe Group near Espanola, New Mexico. (1989). New Mexico Journal of Science. Volume 29(2): p. 69-78.

- Temperature relations and the critical thermal maximum of *Holbrookia maculata maculata* Reptilia Iguanidae. (1978). Sena, A. Southwestern Naturalist; 23(1): 41-50

- Report on the endangered Sanddune (Sagebrush) Lizard, *Sceloporous arenicolous*, in southeastern New Mexico. (1976). With W. G. Degenhardt. U.S. Department of Interior, Bureau of Land Management, Roswell, New Mexico District Office. 1 - 18.

David J. Torres

83 Mimbres Drive, White Rock
Los Alamos, NM 87544

Home: (505) 672-3038
Work: (505) 667-2638
davytorres@juno.com

Education

Ph.D. in mathematics

GPA 4.0, December 1995

University of New Mexico

Dissertation: Integration Operators in the Spectral Tau-Method with Navier-Stokes Applications

M.S. in applied mathematics
GPA 3.9, May 1992
University of Arizona

B.S. in mathematics, B.S. in physics
GPA 3.98, May 1990
New Mexico Tech

Professional Accomplishments

Technical Staff Member at Los Alamos National Laboratory - LANL

(June 2000 through present)

Principal Investigator for DOE Advanced Engine Combustion Initiative at LANL.
Parallelized KIVA with MPI.
Implemented an unstructured version of engine modeling code KIVA-3V.
Developed a conservative remapping scheme with unstructured meshes.
Implemented high pressure phase equilibrium in KIVA-3V (a code designed to simulate gasoline and diesel engines).
Implemented multicomponent fuel model in spray and wall film in KIVA-3V.
Compared model and experimental pressure and spray in an engine.
Constructed 3D KIVA-3V engine meshes.
Implemented finite conductivity model into spray droplets in KIVA-3V.

Postdoc at Los Alamos National Laboratory (February 1998 through June 2000)
Used KIVA-3V to model gasoline direct-injection engines.
Implemented an enhanced heat transfer wall model in the nucleate boiling regime.
Developed and tested surface tension models in a particle-in-cell code.
Developed a no-connectivity front-tracking capability using B-splines.
Helped develop implicit surface tension formulation.

Postdoctoral researcher at New Mexico Tech (1996-1997)
Implemented and used adaptive grids in 2D shallow-water equations.
Implemented a constitutive geological model for EMRTC (Energetic Materials Research & Testing Center) in a Smoothed Particle Hydrodynamic code.
Helped implement a 3D dry hydrostatic atmospheric model.
Parallelized a 2D Navier-Stokes spectral solver in a disk.

Research assistant at the Albuquerque Resource Center (Summer and Fall 1995)
Developed and tested a High Performance Fortran (HPF) test suite.
Conducted workshops.
Programmed 2D parallel Fast Fourier Transforms with the Message Passing Interface (MPI) language.

Research assistant at UNM (Summers 1992 and 1993)

Programmed numerical spectral solutions to partial differential equations.

Adapted an annular Navier-Stokes code to a disk geometry and developed a means of dealing with the coordinate singularity.

Technical and Research assistant at Los Alamos National Laboratories (Summers 1988, 1989, and 1990)

Ran and programmed finite difference and particle-in-cell codes modeling fluid flow.

Computer Experience

12 years experience in scientific programming and numerical techniques
Developed parallel codes in MPI and High Performance Fortran

Teaching Accomplishments

New Mexico Tech (NMT) (1996-1997)
Math Instructor
3 semesters of Calculus II, 1 semester of Calculus I

University of New Mexico (UNM) (1992-1994)
Teaching Assistant
1 semester of Calculus I, 1 semester Calculus I recitation
1 semester Business Calculus, 2 semesters College Algebra

University of Arizona (Fall 1991)
Teaching Assistant
1 semester of College Algebra

University of New Mexico (Summers 1991 and 1992)
Upward Bound Instructor
Taught chemistry, biology, trigonometry and physics to high school students

Publications

- D. J. Torres and M.F. Trujillo, KIVA-4: An Unstructured ALE Code for Compressible Gas Flow with Sprays, accepted by *Journal of Computational Physics*, February 2006.

- M. F. Trujillo and D. J. Torres, Droplet Phase Change in Supercritical Conditions, ILASS Americas, 18th Annual Conference on Liquid Atomization and Spray Systems, Irvine, CA, May 2005.

- D. J. Torres, KIVA-4: Validation, Rezoning, and Remapping, 15th International Multidimensional Engine Modeling User's Group Meeting Proceedings at SAE Congress, Detroit, MI, April 2005.

- D. J. Torres, KIVA-4, 14th International Multidimensional Engine Modeling User's Group Meeting Proceedings at SAE Congress, Detroit, MI, March 2004.

- M.F. Trujillo, D. J. Torres and P.J. O'Rourke, High Pressure Multicomponent Liquid Sprays: Departure from Ideal Behavior, *International Journal of Engine Research*, 5:229-246, 2004.

- P.J. O'Rourke and D.J. Torres, Extension of the KIVA Particle/Spray Model to Flows with Compressible Particles and Large Pressure Gradients, Los Alamos Manuscript, LA-UR-03-2918, April 2003.

- P.J. O'Rourke and D.J. Torres, Finite Difference Approximation of the Equations of the Extended KIVA Particle/Spray Model, Los Alamos Manuscript, LA-UR-03-2917, April 2003.

- M. F. Trujillo, P.J. O'Rourke and D. Torres, Generalizing the Thermodynamics State Relationships in KIVA-3V, Los Alamos Technical Report, LA-13981, October 2002.

- M. F. Trujillo, P.J. O'Rourke and D. Torres, Generalizing the Thermodynamics State Relationships in KIVA-3V, Los Alamos Technical Report, LA-13981, October 2002.

- D. J. Torres, P.J. O'Rourke and A. A. Amsden, Efficient Multicomponent Fuel Algorithm, *Combustion Theory and Modeling*, 7:67-86, March 2003.

- D. J. Torres and P.J. O'Rourke, Multicomponent Fuel Vaporization at High Pressures, 12th International Multidimensional Engine Modeling User's Group Proceedings, Detroit, MI., March 2002.

- D. J. Torres, P.J. O'Rourke and A. A. Amsden, A Discrete Multicomponent Fuel Model, *Atomization and Sprays*, 13:131-172, 2003.

- Jamet, D., D. Torres and J.U. Brackbill, On the Theory and Computation of Surface Tension: The Elimination of Parasitic Currents Through Energy Conservation in the Second Gradient Method, *Journal of Computational Physics*, 182:262-276, 2002.

- H.J.H. Clercx, A.H. Nielsen, D.J. Torres and E.A. Coutsias, Two-dimensional turbulence in square and circular domains with no-slip walls, *European Journal of Mechanics B-Fluids*, 20:557-576, 2001.

- Torres, D., P.J. O'Rourke and A.A. Amsden, A Discrete Multicomponent Fuels Model for GDI Engine Simulations, ILASS Americas, 14th Annual Conference on Liquid Atomization and Spray Systems, Dearborn, MI, May 2001.

- Torres, D. and J.U. Brackbill, The Point-Set Method: Front-Tracking without Connectivity, *Journal of Computational Physics*, 165:620-644, 2000.

- Torres, D. and E.A. Coutsias, Pseudospectral Solution of the 2D Navier-Stokes Equations in a Disk, *SlAM J. Sci. Comput.*, 21:378-403, 1999.

- Brackbill, J. U., D. Juric, D. Torres and E. Kallman, Dynamic Modeling of Microgravity Flow, Fourth Microgravity Fluid Physics and Transport Phenomena Conference, August 1998.

- Nielsen, A.H., D. Torres and E.A. Coutsias, Decaying Two-Dimensional Turbulence in Bounded Flows, International Congress on Plasma Physics and 25th EPS Conference on Controlled Fusion and Plasma Physics, 1998.

- Raymond, D. and D. Torres, Fundamental Moist Modes of the Equatorial Troposphere, *Journal of the Atmospheric Sciences*, 55:1771-1790, 1998.

- Coutsias,E., T. Hagstrom, J. Hesthaven and D. Torres, Integration Preconditioners for Differential Operators in Spectral τ-Methods, ICOSAHOM proceedings, (International Conference on Spectral and Higher Order Methods), June 1995, also published in Houston Journal of Mathematics, 1996.

- Coutsias,E., T. Hagstrom and D. Torres, An Efficient Spectral Method for Ordinary Differential Equations with Rational Function Coefficients, *Math. Comp*., 65:611, 1996.

Awards

Outstanding Teaching Assistant in UNM Department of Mathematics 1994

Efroymson Award for Outstanding Achievement in Mathematics at UNM 1993

Awarded a Ford Foundation Predoctoral Fellowship 1990

Abraham and Esther Brook Award for Achievement in Physics at NMT 1989

APPENDIX C

Guidelines Title 5 NMAC Chapter 5, Part 2

TITLE 5 POST-SECONDARY EDUCATION
CHAPTER 5 POST-SECONDARY EDUCATIONAL PROGRAMS
PART 2 APPROVAL OF NEW GRADUATE PROGRAMS

5.5.2.1 ISSUING AGENCY: New Mexico Higher Education Department (NMHED).
[3/16/51, 7/1/94; 5.5.2.1 NMAC - Rn & A, 5 NMAC 5.2.1, 02/28/07]

5.5.2.2 STATUTORY AUTHORITY: The NMHED has statutory responsibility to review new graduate programs proposed by state universities as part of its authority for statewide planning and oversight of post-secondary education. The Post-Secondary Educational Planning Act, specifically Section 21-2-5 NMSA 1978, authorizes the NMHED to conduct statewide planning, including analyses of state needs for post-secondary educational programs. Section 21-1-24 NMSA 1978 requires that any graduate program that is to benefit from state funding must first be approved by the NMHED and by the New Mexico state board of finance.
[4/5/71, 3/29/73; 5.5.2.2 NMAC - Rn & A, 5 NMAC 5.2.2, 02/28/07]

5.5.2.3 SCOPE: The provisions of 5.5.2 NMAC apply to any new graduate program proposed for implementation by any constitutional institution of higher education in New Mexico.
[2/26/85, 5/4/90, 9/30/97; 5.5.2.3 NMAC - Rn, 5 NMAC 5.2.3, 02/28/07]

5.5.2.4 DURATION: Permanent.
[9/30/97; 5.5.2.4 NMAC - Rn, 5 NMAC 5.2.4, 02/28/07]

5.5.2.5 EFFECTIVE DATE: September 30, 1997, unless a later date is cited at the end of a section.
[9/30/97; 5.5.2.5 NMAC - Rn & A, 5 NMAC 5.2.5, 02/28/07]

5.5.2.6 OBJECTIVE: The objective of 5.5.2 NMAC is to provide an orderly, objective basis for review and approval or disapproval of each new graduate program proposed for implementation. Although this regulation is intended primarily to guide decisions by the NMHED and its staff, it may also be used to guide review by the institutions and by statewide councils of graduate deans and chief academic officers. Decisions about new graduate program proposals shall be exercised so as to:

A. fulfill societal requirements, employer needs and student demand;
B. support high standards of academic quality;
C. encourage cooperation among institutions, public and private;
D. avoid unnecessary or inappropriate duplication; and
E. maximize cost effectiveness for the state.

[2/26/85, 5/4/90, 9/30/97; 5.5.2.6 NMAC - Rn & A, 5 NMAC 5.2.6, 02/28/07]

5.5.2.7 DEFINITIONS:

A. "Graduate program" is defined as any sequence of courses, activities or experiences which leads to award of any degree beyond the baccalaureate degree. Graduate programs subject to 5.5.2 NMAC include those leading to a master's degree, a doctoral degree, or a professional degree in fields such as law, medicine or other professions.

B. "New" graduate program is defined as one that differs from currently approved programs at the proposing institution, in terms of level of degree or area of study.

[2/26/85, 5/4/90, 9/30/97; 5.5.2.7 NMAC - Rn & A, 5 NMAC 5.2.7, 02/28/07]

5.5.2.8 GENERAL REQUIREMENT OF NMHED APPROVAL:

A. No graduate program established following the effective date of 5.5.2 NMAC, nor any student enrolled in that program, shall be eligible for inclusion in any of the NMHED's funding recommendations unless the program has been approved by the NMHED and by the New Mexico state board of finance.

B. In the case of a question of applicability of 5.5.2 NMAC to a particular change in graduate programming, the NMHED staff will consult with the NMHED review board, council of graduate deans, and the New Mexico academic council and will consider the advice of all groups in rendering a decision about applicability. Staff decisions may be appealed to the NMHED's cabinet secretary whose decision will be final.

C. Changes that require approval by the NMHED.

(1) Addition of a doctoral degree in an area in which a master's degree is already awarded, or the converse, is subject to the provisions of 5.5.2 NMAC.

(2) Any substantial change in an existing graduate degree program, which may or may not be reflected as a change in the title of the degree awarded, will be sumitted to the NMHED for review and may be required to undergo the process for approval of new graduate programs (5.5.2.10). Among the tests of substantial change will be (i) change in a curriculum impacting at least one-third of the courses, (ii) change reflecting a new program title in the institution's catalog, (iii) change which adds a distinct and separate course of study at the institution and/or (iv) change that may later change the classification of the proram in the institutions's inventory of instuctional programs.

(a) Addition of a program option, concentration or specialization that will result in a new degree title being awarded will be submitted to the NMHED for review and may be subject to the provisions of 5.5.2 NMAC, but addition of another option, concentration or specialization to an existing approved program that would not change the title of the degree awarded does not require approval of the NMHED.

(b) Proposed changes in the name of an existing program, option, concentration, emphasis, specialization, or number of credit hours, without other substantive change or questions of applicability of 5.5.2 NMAC should be referred to the NMHED for a staff determination of applicability and to assure that the NMHED's data base remains accurate.

D. Changes that do not require approval by the NMHED.

(1) Revisions of the curriculum of a program, option, concentration or specialization that do not alter how the program, enrollments and degrees awarded are reported to the NMHED are not subject to the provisions of 5.5.2 NMAC.

(2) Deletion of a program option, concentration or specialization within an existing graduate program is not subject to the provisions of 5.5.2 NMAC.

(3) Reconfiguration of an existing program in a manner that will retain the title of an existing program and that will not result in a net gain in the number of programs offered by an institution, such as consolidation of two or more programs into a single program, is not subject to the provisions of 5.5.2 NMAC.

(4) Change in the department responsible for a graduate program, without a substantial change in the curriculum of the program and without a corresponding change in the title of the degree awarded, is not subject to the provisions of 5.5.2 NMAC.

(5) A program, option, concentration or specialization that has been prepared to meet a request of a particular employer and that will be financially supported by that employer is not subject to the provisions of 5.5.2 NMAC. However, such programs are considered restricted and do not receive state funding. Students enrolled in such programs are not eligible for any state support until the program is approved pursuant to 5.5.2 NMAC and the program becomes unrestricted.

(6) Dormant programs. Dormant programs are graduate degree programs that have not admitted new graduate students for a period of three consecutive years. The institution of higher education must inform the NMHED about dormant programs each year and indicate whether or not the program of study will be deleted by the institution or revised to attract new graduate students. Programs can be dormant for a period of six years. Plans to revise degree programs that require changes in the type of degree awarded require approval by the NMHED.

(7) Post-baccalaureate certificate of specialization.

E. Post-baccalaureate certificate programs do not require the same level of review and approval as post-baccalaureate degree programs. The NMHED will need to approve programs that demonstrate financial need and require additional resources in the form of new funding, additional faculty or additional facilities. Certificate programs that do not require new resources and can be implemented with existing faculty, existing courses, and existing facilities can be approved internally as indicated below. A certificate of specialization is a program of study that is designed to develop or enhance a focused area of expertise. The primary purpose of certificate programs is to provide specific skill training and to enhance employability and quickly meet manpower needs within the state of New Mexico. Certificate programs can be offered to currently enrolled degree seeking students and students that meet the admissions criteria but that enroll solely to obtain a certificate in a given area of expertise.

F. Concentrations or specializations differ from certificate programs in that they are designed to meet the needs of enrolled degree seeking students within the given institution of higher education.

G. Certificate programs offered by institutions of higher education within the state of New Mexico must include at least 12 credit hours of course work that is interrelated and designed to develop a focused skill or area of expertise. Certificate programs cannot exceed 18 credit hours. Courses that comprise the certificate must be regular approved courses that are already offered by the institution.

H. Certificate programs that do not require new resources and can be implemented with existing faculty, existing courses, and existing facilities can be approved internally by the appropriate mechanisms within the institution of higher education and the chief academic officer of that institution. Approved certificate programs must be registered with the NMHED within three months of approval. The registration process includes submitting a copy of the proprosal, a CIP code request, and a copy of the signature sheet documenting the approval process for the new certificate program.

I. The NMHED will serve as a clearinghouse for information regarding degree and certificate programs offered in the state of New Mexico. A web-based listing of certificate programs posted on the NMHED website will allow potential students to obtain a comprehensive picture of educational opportunities within New Mexico.

J. Internal proposals for new certificate programs should include information on the rationale for the certificate, evidence of need, statements on the ability to meet manpower needs within the state, enrollment projections, and an evaluation plan that indicates whether or not the needs of the state are being met.

K. Certificate proposals that require new resources must develop a proposal for external approval by the New Mexico council of graduate deans, the academic council, the NMHED, and the New Mexico state board of finance, following the process for new degree proposals.

L. Students enrolled in post-baccalaureate certificate programs must meet the same minimum admissions criteria as students admitted into graduate degree programs at the institution of higher education.

M. Institutions of higher education must notify the NMHED immediately if a certificate program is discontinued.

[2/26/85, 5/4/90, 9/30/97; 5.5.2.8 NMAC - Rn & A, 5 NMAC 5.2.7 & 8, 02/28/07]

5.5.2.9 REQUIREMENTS FOR APPROVED GRADUATE PROGRAMS: The requirements and questions listed below will be used in reviewing proposals to establish new graduate programs. The NMHED reserves the right to weigh these factors differentially and to consider additional factors in reaching decisions that best meet the interests of the state of New Mexico. These requirements are constructed to reflect state-level interests in post-secondary education; reviews of new graduate programs within the proposing institution are expected to reflect a somewhat different balance of concerns, for example, devoting greater consideration to details of program quality.

A. Purpose of the program and mission of the proposing institution. The proposed program must have a clear purpose that is consistent with the mission of the proposing institution.

(1) What is the primary purpose of the proposed program? What are its secondary purposes, if any?

(2) Is the proposed program consistent with the role and scope of the institution as set forth in its mission statement and interpreted by its governing board?

(3) What is the institution's priority for the proposed program, as indicated in its most recent plans, funding requests or other institutional documents?

(4) What is the curriculum for the proposed program? What types of courses and other degree requirements are needed for degree completion? What types of

skills or competencies will students develop as a result of completing the degree prgoram?

B. Justification for the program. The proposed program must meet one or more specified needs within the state or region; must not duplicate existing programs unnecessarily or inappropriately; and, to the extent feasible and appropriate, should benefit from cooperative arrangements with other institutions.

(1) Need. The proposed program must meet one or more specified needs within the state or region. Clear and convincing evidence must be provided of the reality and extent of such need.

(a) Why is the program needed? Will graduates of the program help meet some specified state or regional workforce need? Have specific potential employers requested or expressed interest in, the program? What, if any, internal institutional needs will also be met by the program?

(b) Evidence of need might include results of employer surveys, current labor market analyses and projections, or long-term need projections prepared by a relevant professional organization. Summaries of student interest also are appropriate but will not by themselves be considered sufficient evidence of need.

(c) Although academic and research interests of institutional faculty may be met through implementation of the proposed program, such interests by themselves are unlikely to persuade the NMHED of need for the program. However, institutions of higher education may build programs around their areas of excellence. A clear demonstration of such excellence is expected in the proposal.

(2) Duplication. The proposed program must not duplicate existing programs unnecessarily or inappropriately. A proposal for a program similar to one (or more) that already exists within the state must present clear and convincing evidence that need for the program cannot be met by the existing program(s).

(a) Is this program, or are similar programs, offered at any other public or private institutions within New Mexico?

(b) If so, what is the remaining capacity of the program(s)? How many students could the existing program(s) accommodate without additional resources for faculty, equipment, facilities and other needs?

(c) In light of the above information, why should the proposed program also be approved? What programmatic, geographic or other factors warrant approval of the program as an addition to the existing educational resources in the state?

(d) Do New Mexico students have access to a comparable program in another state through either the WICHE professional student exchange or the WICHE regional graduate program?

(e) As evidence, the proposing institution must assemble and display data listing each similar program offered by regionally accredited public and private universities in New Mexico; the numbers of students admitted to each of those programs during each of three recent, consecutive years; the numbers of degrees/ certificates awarded during each of those years; and each university's estimated remaining capacity of its program(s).

(f) To the extent feasible and appropriate, statements from representatives of the existing programs should be attached to the proposal, articulating their positions with regard to the proposed program.

(g) The purpose of this requirement is twofold: (i) to assure that communication has taken place with existing programs, as an element in planning the proposed program, and (ii) to aid reviewers in assuring that there is need for the program that cannot be met through existing programs.

(3) Inter-institutional collaboration and cooperation. The NMHED strongly encourages collaborative relationships with other programs within New Mexico, so that state investments can be shared and students can benefit from expanded opportunities across institutional boundaries.

(a) Are there programs at other institutions, and particularly programs already supported by the state, through which shared instruction, collaboration with faculty or other means of broadening student options and experiences can be arranged as part of the proposed program?

(b) If the proposed program is related to other programs operating at public institutions in the state, the proposal should document how collaboration will be achieved with those programs. For example, if it is feasible and productive to share faculty, instruction or other assets with an existing program at another institution, the proposal should outline how that collaboration will take place. If other arrangements for expanding students' experiences can be made with other institutions, those arrangements should be summarized.

C. Clientele and projected enrollment. The proposal must clearly describe the population of students who will be recruited for the proposed program and must include a detailed projection of enrollment and credit hours anticipated during the first five years.

(1) Clientele.

(a) Who are the students to be served by the proposed program? Will the program concentrate its recruitment upon students representing some particular geographic area, students from some special employment sector or some other identified group?

(b) What academic or experiential qualifications will be set for admission?

(c) Will the proposed program be consistent with state goals for equitable representation of all students? How will the program assure equal access and success of students from groups historically underrepresented in graduate education or in the fields of employment for which the program is intended to prepare its graduates?

(i) At a minimum, the proposal should include data illustrating the representation of diversity in ethnic and sex/gender groups of (a) undergraduate students and (b) graduate students at the proposing institution and should articulate the methods that will be used to assure equity in access and success in the proposed program.

(ii) To the extent possible, the proposal also should include information about representation in the fields of employment for which the program is intended to prepare students and other information relevant to assessing the capacity of the program to help redress underrepresentation.

(2) Projected enrollment.

(a) The proposal must display, in clear tabular form, the projected enrollment in the proposed program during its first five years. This presentation must distinguish the number of new students (headcount) expected to enroll each year, the

number of returning students expected to re-enroll in each year, and the methodology used to arrive at those projects.

(b) The proposal should indicate the number of students expected to enroll full-time and the number expected to enroll on a part-time basis and must display the total number of student credit hours expected to be generated in each of the first five years.

D. Institutional readiness for the program. The institution should have nearly all of the resources needed to initiate the program. The proposal should include a clear statement of the extent to which the institution is ready to initiate the program, citing the remaining needs and recognizing each of those needs in the cost analysis developed pursuant to Subsection E of 5.5.2.9 NMAC.

(1) Is the teaching faculty adequate in number and qualifications to initiate the program? If not, what additional faculty are needed? To what extent will the program rely upon graduate assistants to free faculty time for graduate instruction in the proposed program?

(2) Are the library and other academic support resources sufficient to initiate the program? If not, what additional resources are needed?

(3) Are the physical facilities of the institution adequate for the first five years of the program? Will additional space or modifications of existing space be required within the first five years of program operation?

(4) Are the institution's equipment and technological resources adequate for the first five years of the program? What, if any, additional equipment will be needed?

(5) Are other operating resources adequate to initiate the program? For example, will additional clerical or specialized personnel be needed?

(6) Are there existing external facilities that will be used? Have agreements been established to ensure use of those facilities? For example, if you are offering a nursing or allied health program have you established a partnership with local hospital(s) and other clinical settings?

E. Projected cost of the program. The proposal must include a clear analysis of the projected cost of the proposed program and the sources of funding that will support it.

(1) New costs for program start-up. The proposal should provide a clear indication of new costs that must be met in order to begin the program and to sustain it during its first five years. The analysis must address at least the following cost categories:

(a) Additional faculty needed for the program, full-time and part-time.

(b) Additional library resources needed for the program. The proposal should include a statement from the university librarian, indicating the cost of these new resources and the schedule on which the resources will be provided.

(c) Additional facilities, equipment and technological resources needed for the program.

(d) New graduate assistantships needed to support the program, including the dollar value of the assistantships during each of the first five years of the program.

(2) State support. An analysis must be presented showing the approximate amount of state operational formula funding that will flow to the program for each of the first five years, based upon the projected student credit hours and current formula funding factors, and recognizing the delay and averaging characteristic of the formula.

(3) Other support. If the proposed program will benefit from other sources of operational support, the proposal should describe those. For example, if particular cost categories such as new equipment or additional graduate assistantships are expected to be supported by research grants, contracts or other sources, the proposal should clearly describe those sources and levels of support and should indicate the advantage to the state of receiving such support.

F. Quality of the program. The proposed program must be designed to meet high standards of academic quality, considering its instructional curriculum, faculty, student admission standards, opportunities for experiential learning and academic support, and provisions for continual review and improvement of the program.

(1) All programs supported by state funds are expected to comply with principles of academic quality delineated as part of the NMHED's regulation on instructional funding: 5.3.12 NMAC.

(2) Among the questions that will be considered in evaluating proposals for new graduate programs are the following:

(a) Is the curriculum adequately structured to meet the stated purposes of the program?

(b) Is the faculty adequate in number, experience and availability to offer a high quality program?

(c) How do the proposed academic admission standards for students entering the program compare with standards for other programs at the institution and with admission standards for comparable programs at other institutions in New Mexico or other states?

(d) How will the proposed program utilize current technologies to support program quality and delivery?

(e) What opportunities will be available for assisting students to gain experiences relevant to work settings for which the program will prepare them?

(f) What academic support services are available to students, to assist them in succeeding in the program?

(g) What final integrating experiences or other features will be used to assure that graduates have acquired the knowledge and skills expected for the degree or certificate awarded?

(h) Has the proposed program been evaluated by any external reviewers or is there other external evidence or opinion regarding the quality of the program?

(i) When will the new program be proposed for accreditation by the higher learning commission of the north central association?

(j) Will specialized accreditation be sought for the program? If so, when?

G. Assessment of operations and impact. The proposal must include a plan by which the proposed program will be assessed for its operation and impact over at least a five-year period.

(1) At a minimum, the plan must indicate methods that will be used to monitor program operations, progress of students and program completion rates.

(2) The plan also must include methods for obtaining evaluations from students, graduates or other appropriate sources and feeding that information into future operation of the program.

H. Administrative responsibility for the program and institutional commitment. There must be clear indication in the proposal that the institution is committed to the success of the proposed program.

(1) The proposal should indicate where in the structure of the institution the program will be administered. For example, which department will have primary responsibility and which additional departments, if any, will contribute to operation of the program?

(2) The proposal should include a clear statement of administrative support for the program, sufficient to assure that resources will be provided during the first five years of the program. The proposal should also verify that all within-institution approvals needed for the program have been granted, including approval by the institution's governing board.

[2/26/85, 5/4/90, 9/30/97; 5.5.2.9 NMAC - Rn & A, 5 NMAC 5.2.9, 02/28/07]

5.5.2.10 PROCESS FOR APPROVAL OF NEW GRADUATE PROGRAMS:

A. Before submitting a proposal for review by the NMHED, an institution must have completed all internal institutional reviews required for new graduate programs. The proposal must be in a form that is fully supported by the institution.

B. Advance notice to the NMHED staff of the intent to submit a proposal for a new graduate program is required, as it will assist in planning and will create a more efficient review process. A proposal should be submitted to the NMHED and the council of graduate deans at least nine months prior to the anticipated date of implementation of the program, in order to allow sufficient time for review by the council of graduate deans, the academic council, the NMHED review board and the New Mexico state board of finance prior to implementation. Programs cannot be included in institutional catalogs until they have been approved.

C. The proposal may be submitted simultaneously to the NMHED and to the council of graduate deans. The NMHED staff will begin an independent review of the proposal and will follow the proposal through the review process with the council of graduate deans and the academic council. Members of the council may solicit input on the proposal from cognizant members of their faculty, for inclusion in the council's consideration. As it deems appropriate, the council may suggest modifications of the proposal or the proposed program.

D. If the council of graduate deans finds that the proposed program warrants further consideration, it will forward its written recommendation and comments to the academic council on higher education (the chief academic officers of the state universities) and to the NMHED. A proposal considered but not recommended by the council of graduate deans may be forwarded by the sponsoring institution directly to the academic council.

E. The academic council will conduct its review of the proposal and may suggest modifications of the proposal or the proposed program. The NMHED staff will participate in the review by the academic council.

F. When the academic council has completed its review of the proposed program, it will notify the NMHED that the proposal is ready for consideration by the NMHED. The council will forward to the NMHED its written comments regarding the proposed program.

G. Following notification by the academic council, the proposal will be subjected to independent review by the NMHED staff. The NMHED staff may request additional information from the institution for use in its review. Based upon the outcome of its review, staff will submit a written recommendation to the NMHED review board indicating either (1) that the proposal satisfies the requirements set forth in this regulation and that the NMHED recommends approval of the program; or (2) that staff recommend denial of the proposal. Information supporting the decision to deny the proposal will be included.

H. Following completion of the staff review, the proposal and staff recommendation will be considered by the NMHED review board. The proposal and staff recommendation will be presented as an approval item at the next NMHED review board meeting. The NMHED may elect to return a proposal to the sponsoring institution, for modification, or to the council of graduate deans, the academic council, or both, for reconsideration. At any point during the review process, the sponsoring institution may withdraw its proposal.

I. If the NMHED review board approves the proposed program, the NMHED staff will submit the proposal or an appropriate summary of the proposal, along with the council of graduate deans, the academic council's, the NMHED review board's, and the NMHED's recommendations, to the New Mexico state board of finance. The NMHED staff will notify the institution of the date when the New Mexico state board of finance has scheduled its consideration of the proposal.

J. The NMHED staff will present a summary of the proposed program along with the recommendation of the NMHED to the New Mexico state board of finance. Institution personnel will be expected to be present to answer questions, present additional information or provide justification of the proposal to the New Mexico state board of finance. The role of the NMHED staff will be to present the recommendation of the NMHED to the board.

[9/30/97; 5.5.2.10 NMAC - Rn & A, 5 NMAC 5.2.10, 02/28/07]

HISTORY OF 5.5.2 NMAC:

Pre-NMAC History: The material in this part was derived from that previously filed with the State Records Center and Archives under:

BEF Rule 210, Graduate Programs - Approval of New, 2/26/85.

CHE Rule 210, Graduate Programs - Approval of New, 5/4/90.