

**Project South Texas  
Academic Program Working Groups  
Final Report**

**January 31, 2014**

<b>Working Group Name</b>	Sciences and Math
<b>Working Group Co-Chairs</b>	Frederic Zaidan & Elizabeth Heise
<b>Working Group Members</b>	Andras Balogh, Nicholas Dimakis, David Hicks, Jerzy Mogilski, Justin Moore, Jason Parsons, Soma Mukherjee, Christina Villalobos

### **Executive Summary**

In most respects, the existing Science and Mathematics faculty/programs address the missions of UT RGV. It is simply a matter of “fine tuning” our operations when we become a new university. All of our proposed actions build on the strengths of the two institutions and seek to eliminate current weaknesses. We have proposed a College of Science and Mathematics organized with a Dean, an Associate Dean for Academics, and an Associate Dean for Research. The Departments (led by Chairs) serve as the organizational entity for the faculty and the students. Faculty and students then would have the flexibility to interact with the various research centers (led by Center Directors) and teaching programs (led by Program Directors) without being constrained by their home department. This approach would facilitate an increase of the already prevalent transdisciplinary interactions.

Because of the focus on the geographic region, the new College would be naturally bicultural/binational/biliterate/bilingual and would also engage the community. Both the proposed teaching programs and the proposed research centers were designed to meet the demands of our growing population. Once all are implemented, our proposed actions will bring considerable positive attention to our College and our University from the State, National, and International levels.

With the national attention on adding STEM graduates, we see UT-RGV as a great opportunity to grow the offerings in STEM fields for the LRGV. We propose to continue offering lower-division and upper-division courses in all of the sciences and mathematics fields on both academic campuses of the new university. An example of how the faculty will work together to help students throughout the region earn their STEM degrees is that we will coordinate the scheduling upper-division courses so that students will have as many courses available as possible. For instance, Physical Chemistry I and II have been offered every other year at UTB and UTPA. With our new college, Physical Chemistry can be offered in even numbered years in one location and odd numbered years in the other. This will make courses available at all times and semester to the students of UT-RGV.

Faculty from both academic campuses have been collaborating on research for years. We see the collaborations continuing and expanding with the new structure. The new interdisciplinary research centers will be home to faculty to help facilitate additional collaborations. Fortunately, this will not be new to the faculty, just a modification in the structure of how it is organized. We see this as an opportunity to leverage additional external funding for regional collaborations.

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What the faculty see in this process are many opportunities for growth and expansion of existing and growing programs. We seek expansion rather than concentration of programs in one location or the other.

## Working Group Meetings

Date	Location/Format
Monday, Oct 7, 2013	WebEx
Monday, Oct 14, 2013	Face to Face – University Center
Friday, Oct 25, 2013	Face to Face – University Center
Friday, Dec 13, 2013	Face to Face – UTPA
All other business conducted via phone and email throughout	

## Current Academic Programs

UTB	UTPA
BS Biology	BS Biology
BS Chemistry	BS Biology PreMedical
BS Environmental Sciences	BS Biology PreDental
BS Mathematics	BS Biology PreOptometry
BS Biology - UTeach	BS Chemistry
BS Chemistry - UTeach	BS Chemistry PreMedical
BS Environmental Sciences - UTeach	BS Environmental Sciences
BS Mathematics - UTeach	BS Mathematics
MS Biology	BS Physics
MS Mathematics	BS Biology – Life Sciences
MS Physics	BS Physical Sciences
MSIS - Biology	BS Life Sciences - UTeach
PhD Physics Cooperative with UTSA	BS Chemistry - UTeach
	BS Secondary School Math - UTeach
	BIS Middle School Mathematics - UTeach
	BS Physics & Math - UTeach
	MS Biology
	MS Chemistry
	MS Mathematics
	MSIS Physics

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**Current Academic Programs to be Offered Fall 2015**

<b>Bachelor's Degrees</b>	<b>Master's Degrees</b>	<b>Doctoral Degrees</b>
BS Biology	MS Biology	PhD Physics Cooperative with UTSA
BS Chemistry	MS Chemistry	
BS Environmental Sciences	MS Mathematics	
BS Mathematics	MS Physics	
BS Physics		
BS Biology - UTeach		
BS Chemistry - UTeach		
BS Environmental Sciences - UTeach		
BS Mathematics - UTeach		
BIS Middle School Mathematics - UTeach		
BS Physics - UTeach		
BS Biology PreMedical		
BS Biology PreDental		
BS Biology PreOptometry		
BS Chemistry PreMedical		

**New Academic Programs for Fall 2015** (Please indicate with an asterisk (\*) your top 3 priorities.)

<b>Bachelor's Degrees</b>	<b>Master's Degrees</b>	<b>Doctoral Degrees</b>
BS Biology Marine Biology		PhD Physics Cooperative with UT Arlington

**New Academic Programs for Fall 2017** (Please indicate with an asterisk (\*) your top 3 priorities.)

<b>Bachelor's Degrees</b>	<b>Master's Degrees</b>	<b>Doctoral Degrees</b>
BS Biology Cell Molecular	*MS Environmental Sciences	*PhD Biology
BS Biology Subtropical	MS Sustainability Studies	PhD Physics
		*PhD Mathematics

**New Academic Programs for Fall 2020** (Please indicate with an asterisk (\*) your top 3 priorities.)

<b>Bachelor's Degrees</b>	<b>Master's Degrees</b>	<b>Doctoral Degrees</b>
BS Geology	*MS Statistics	*PhD Chemistry
		*PhD Environmental Sciences
		PhD Statistics

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**New Academic Programs for Fall 2025** (Please indicate with an asterisk (\*) your top 3 priorities.)

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<b>Bachelor's Degrees</b>	<b>Master's Degrees</b>	<b>Doctoral Degrees</b>
TBD	TBD	TBD

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**Examples of innovative programs**

*Identify institutions and/or programs that are organized in an innovative way. In what ways are the programs innovative? How does this organization promote student success and/or scholarly activity?*

The nature of science is to always innovate. The programs that we current teach are constantly evolving. The faculty members are aware of trends in their fields and accommodate those as appropriate. Along these lines we feel our programs are innovative. Existing undergraduate science programs have undergraduate research experiences as either a mandatory or option for students; these experiences have a proven track record for transitioning students into graduate programs.

**Possible consultations**

*Identify campuses that faculty and administrators who are engaged in further planning may wish to study or visit and/or leaders/scholars that planners may wish to consult.*

The committee feels that there is no need to use valuable resources for consultation. Science and mathematics faculty regularly attend national and international conferences and collaborate with peers throughout the world. Because of all of this interaction we feel we are well aware of models of organization at other institutions. We have reached out to them individually and feel that this was sufficient to complete the charge of this committee.

**Trans-disciplinary Opportunities**

*Describe the trans-disciplinary opportunities that extend beyond your group of disciplines.*

All science programs are naturally transdisciplinary. There are several transdisciplinary research areas that we have identified as opportunities for synergistic collaboration. These include but are not limited to subtropical studies, biomedical studies, material sciences & engineering, environmental sciences, sustainability studies and STEM education. See figure on last page.

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## Bicultural/ Biliterate/Bilingual

*Describe how the proposed academic programs reflect the bicultural/bilingual/biliterate mission of the new university and culture of our region.*

There are numerous opportunities for binational research, teaching and collaboration in all science fields. These include but are not limited to subtropical studies, environmental sciences, sustainability studies and STEM education. Our concentrations in these areas reflect our strengths of research within the region. See figure on last page.

## Community Engagement

*Describe how the proposed academic programs reflect the community engagement mission of the new university.*

The proposed programs are designed to meet the demands of the Valley community. Because of the strong focus on local issues, numerous opportunities for outreach efforts exist. These efforts will improve the quality of all life, human and otherwise. Community engagement is an essential component of our programs.

## Academic Structure

*Describe the academic structure you are recommending for your group of disciplines.*

We propose a college of Science and Mathematics organized with a dean, an associate dean for academics, and an associate dean for research. See figure on last page. The research enterprise would be organized with numerous centers each with a director answering to the associate dean for research. The teaching would be organized within the many undergraduate and graduate programs grouped by discipline, each with a program director who answers to the associate dean for academics. Additionally there would be a program director for the cluster of UTeach programs and a program director for the cluster of PreMed programs. The UTeach and PreMed directors would work with the discipline directors to coordinate course offerings in these programs. The faculty will be housed in departments with chairs who answer to the dean. Each faculty will have the ability to associate with as many research centers and academic programs as they deem appropriate. This less siloed structure allows for flow between disciplines for both research and teaching opening up transdisciplinary educational opportunities for both undergraduate and graduate students.

Possible Centers	Departments	Academic Programs
Biomedical Science	Biology	UTeach Programs director
Computational and Experimental Mathematics	Chemistry	PreMed programs director
Environmental Sciences and Engineering	Environmental Sciences	Biology – undergrad programs
Gravitational Wave Astronomy	Mathematics	Chemistry – undergrad programs
Material Sciences and Engineering	Physics	Environmental Sciences – undergrad programs
Nonlinear Dynamics		Mathematics – undergrad programs
Pure and Applied Chemistry		Physics – undergrad programs
Radio astronomy		Biology – grad programs
STEM Education		Chemistry – grad programs
Subtropical Studies		Environmental Sciences – grad programs
Sustainability Studies		Mathematics – grad programs
		Physics – grad programs

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