

Academic Enhancement of the Biology Degree Program at SAU

~NSF TIP EAC Meeting~

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Welcome & Introductions

Project Progress Review

Project Primary Goal

The **primary goal** of this project is to increase the # of Science, Technology, Engineering and Mathematics (STEM) biology majors that;

- 1) graduate in 4-5 yrs
- 2) pursue the MS/PhD biological sciences degree, specifically in the areas of environmental science and plant biotechnology,
- 3) complete the MS/PhD in a STEM discipline and/or
- 4) Secure a job/career in a STEM field

Project Primary Objectives

- Expose biology majors to environmental science & plant biotechnology career opportunities
- Better prepare students for the rigors of graduate studies & careers in STEM fields
- Increase number of students who pursue graduate degrees (MS & PhD) in STEM disciplines including environmental science & biotechnology

Associated Activities

- Add an environmental science course to the biology major Plan of Study
- Modernize laboratory space & equipment to better accommodate new & revised courses
- Expand the number/types of activities that increase student interest and success in STEM
- Establish/expand research internships for students at partner institutions during summer & academic year

Specific Activities¹

- **Develop BIOL 210 – ‘*Introduction to Environmental Science*’**
 - Develop course content/select course materials
 - Develop laboratory format
 - Course submission & approval by Curriculum Council

Specific Activities²

- **Modernize Teaching Laboratories as follows:**
 - purchase supplies & equipment for laboratories
 - Set up equipment & organize laboratory exercises
 - Upgrade & organize greenhouse (STEM Club Project)
 - Establish relationship/partnership with NC Museum of Life & Sciences

Specific Activities³

- **Develop Internship Partnerships/Opportunities:**
 - dialogue with lab PIs in the Environ Sci/Plant Biotech. to establish summer & AY research opportunities
 - Advertise research & graduate school opportunities
 - Review student applications/recommendation letters
 - Visit/follow-up with PIs & laboratories that provide internship & graduate school opportunities

Specific Activities⁴

- **Expand Student Interest & Success:**
 - Seminars in plant biotechnology/environmental science
 - Expand Faculty/Peer tutorial services
 - Field trips to STEM-related companies/museums, etc.
 - On-site GRE Prep Courses

Specific Activities⁵

- **Expand Student Interest & Success Cont'd:**
 - Provide GRE Examination financial support
 - Research conference attendance/participation in oral/poster presentations

Measurable Outcomes – Year One¹

- Developed course syllabus for BIOL 210
- Selected & developed course topics & materials
- Developed laboratory format
- Submission & Approval from Curriculum Council

Measurable Outcomes – Year One²

- **Modernize Teaching Laboratories as follows:**
 - Purchase equipment for laboratories
 - 1 GelDoc XR+ ImageLab
 - 1 Smartspec Spectrophotometer
 - 2 Thermal Cyclers
 - 2 Microcentrifuges
 - Set up equipment & organize laboratory
 - Lab renovations incomplete – (December 2013)
 - Upgrade & organize greenhouse (STEM Club Project)
 - Submitted proposal under review
 - Establish relationship/partnership with NC Museum of Life & Sciences
 - Agreement in Principle confirmed

Measurable Outcomes – Year One³

- **Develop Internship Partnerships/Opportunities:**
 - NIEHS – Scholars Connect Program – Summer & Academic Year
 - Brittany Dunigan, Jennifer Plair, Kacey McHoney (Seniors)
 - North Carolina State University
 - Chiang Lab Forest & Biotechnology Group – Courtney Mosley (CDC Atlanta), Jamian Smith (MS ECSU), Joaquin Green
 - Bird & Neilson Labs Bioinformatics Research Group - Ariel Brown (MS – NCCU), Morgan Barham (PhD – Emory), Laurian Bashay (Senior)
 - Fort Valley State University Center for Biotechnology
 - Sarwan Dhir – Unique Gupton & Derrick Williams (Seniors)

Measurable Outcomes – Year One⁴

- **Develop Internship Partnerships/Opportunities Cont'd:**
 - North Carolina State University – New Partnerships
 - Patricia Estes (Genetics), Frank Hunte (Materials Sciences), Terri Long (Plant Biology)
 - University of Arkansas, Fayetteville (4 summer students)
 - Colorado State University (2 summer students)
 - Ongoing Partnerships

Measurable Outcomes – Year One⁵

- Advertise research opportunities
 - Bulletin Boards, Forwarded Email Announcements, target individual students regarding specific opportunities
- Review student applications/recommendation letters
 - Faculty document students they assisted with applications
- Visit/follow-up with PIs that host/sponsor interns
 - Melton connects with PIs via phone/email or visit lab

Measurable Outcomes – Year One⁶

- **Expand Student Interest & Success:**
 - Seminars in plant biotechnology/environmental science
 - Expand faculty/peer tutorial services
 - Established Peer Mentoring Program
 - Field trips to STEM-related companies/museums, etc.
 - Gregory Vineyards – Angier, Science Museums, etc.
 - On-site GRE Prep Courses & Exam Financial Support
 - Negotiations ongoing for Spring Semester

Measurable Outcomes – Year One⁷

- **Expand Student Interest & Success Cont'd:**
 - Provided GRE Examination financial support
 - Sponsored 10 Examinations - \$185/exam
 - Research conference attendance/participation in oral/poster presentations
 - Shaw U Student Research Symposium(5 students – 1 oral, 4 posters)
 - NC State Undergraduate Research Symposium (1 student poster)
 - Va-NC LSAMP – VCU, Richmond (6 students – 2 oral, 2 posters)
 - ABCRMS – San Jose, Ca 2012 (6 students – 3 posters , 1st Place winner)
 - AGMUS – San Juan, PR (2 students – oral presentations)

Measurable Outcomes – Year Two¹

- Taught BIOL 210 (Environmental Science) – 6 students
- Used DVDs as a platform for topics of study
- Lab portion of course at NC Museum of Natural Science & the Nature Research Center
 - Students presented laboratory experience at end
- Agreement to have students in Spring 2015 Semester
 - Liz Baird gave a Science Series Seminar – 11/06/2014

Measurable Outcomes – Year Two²

- **Modernize Teaching Laboratories as follows:**
 - Set up & begin using purchased equipment for lab expts.
 - 1 GelDoc XR+ ImageLab 2 Thermal Cyclers
 - 1 Smartspec Spectrophotometer 2 Microcentrifuges
 - Set up additional equipment & organize laboratory
 - Lab renovations ongoing (May 2015)
 - Upgrade & organize greenhouse (STEM Club Project)
 - Comparative proposals to be submitted (new vs. renovated)
 - Establish a garden for student lab projects (use as Community Garden)
 - Location identified and secured

Measurable Outcomes – Year Two³

- **Develop Internship Partnerships/Opportunities:**
 - NIEHS – Scholars Connect Program – Summer & Academic Year
 - Brianda Elzy, DeAsia Lewis, and Nicole Scirotno,
 - North Carolina State University
 - Chiang Lab Forest & Biotechnology Group – Courtney Mosley (CDC Atlanta), Jamian Smith (MS ECSU), Joaquin Green
 - Bird & Neilson Labs Bioinformatics Research Group - Ariel Brown (MS – NCCU), Morgan Barham (PhD – Emory), Laurian Bashay (2nd Lt. US Army - Korea)
 - Fort Valley State University Center for Biotechnology
 - Sarwan Dhir – Unique Gupton (employed Chiropractic Firm) & Derrick Williams (Senior)

Measurable Outcomes – Year Two⁴

- **Develop Internship Partnerships/Opportunities Cont'd:**
 - North Carolina State University – New Partnerships
 - Patricia Estes - Department of Genetics
 - Seminar Presentation – 10/22/2013
 - Derrick Williams - Advanced Genetics Laboratory (GN 425)
 - Frank Hunte – Department of Materials Sciences
 - Seminar Presentation – 02/20/2014
 - North Carolina A&T State University
 - Marcia Williams – NSF Bridges to the Doctorate Program
 - Seminar Presentation – 02/27/2014
 - Terri Long (Plant Biology) – Laretta Ihenatu (Conference)
 - Other Ongoing Partnerships – see handout

Measurable Outcomes – Year Two⁵

- Advertise Research Opportunities
 - Bulletin Boards, Forwarded Email Announcements, target individual students regarding specific opportunities
- Review student applications/recommendation letters
 - Faculty document students they assisted with applications
- Visit/follow-up with PIs that host/sponsor interns
 - Melton connects with PIs via phone/email or visit lab

Measurable Outcomes – Year Two⁶

- **Expand Student Interest & Success:**
 - Seminars in plant biotechnology/environmental science
 - Expand faculty/peer tutorial services
 - Ongoing Peer Mentoring Program - Cunningham
 - Field trips to STEM-related companies/museums, etc.
 - On-site GRE Prep Courses & Exam Financial Support
 - Negotiations ongoing for Spring Semester

Measurable Outcomes – Year Two⁷

- **Expand Student Interest & Success Cont'd:**
 - Provided GRE Examination financial support
 - Sponsored 10 Examinations - \$190/exam
 - Research conference attendance/participation in oral/poster presentations
 - Shaw U Student Research Symposium(4 students – 4 posters)
 - NC State Undergraduate Research Symposium (4 student posters)
 - Va-NC LSAMP – VCU, Richmond (6 students – 4 posters, 3rd Place Winner)
 - ABCRMS – Nashville, Tennessee 2013 (8 students – 5 posters, 1st Place Winner)
 - ABCRMS – San Antonio, Texas 2014 (10 students – 5 posters)



Thank You!

Questions/Comments?