AGENDA
West Virginia State University
BOARD OF GOVERNORS
Erickson Alumni Center, Grand Hall
June 18, 2015
12:30 p.m.

1.	Call to Order, Oath of Office, and Roll Call – Chair Tom Susman, presiding		
2.	Verification of Appropriate Notice of Public Meeting	Action	2
3.	Review and Approval of Meeting Agenda	Action	1
4.	Review and Approval of Minutes of Previous Meeting	Action	3
5.	Announcements from the Chair		
	a. Resolution Presentation	Action	12
	b. Proposed Fiscal Year 2016 Meeting Dates	Action	13
	c. Fiscal Year 2016 Election of Officers	Action	14
	d. Approval of Presidential Review Committee	Action	15
6.	Reports from Board Committees		
	a. Recruitment and Retention		
	b. Audit		
	c. Academic Policies		
	d. Finance		
7.	Possible Executive Session under the Authority of West Virginia Code §6-9A-4 to Discuss Legal, Personnel, and Property Matters		
8.	Report from the University President		
	a. University Reports Forwarded by Board Committees		
	i. Program Review – Biotechnology, M.A.	Action	16
	ii. Program Review – Biotechnology, M.S.	Action	146
	iii. HEPC Institutional Compact	Action	277
	iv. BOG Budget Report	Information	282
9.	Special Recognition and Other Matters		
10.	Next Meeting Date – *September 3, 2015 (Tentative)*		
11.	Adjournment		

West Virginia State University
Board of Governors

Date/Time: 6/18/2015 -- 12:30 PM

Location:

West Virginia State University,
Erickson Alumni Center, Grand Hall,
Institute, WV

Purpose: To conduct regular business of the Board

Notes:

This is a compliant meeting.

Meeting was approved : 6/1/2015 2:54:38 PM

West Virginia State University Board of Governors
Erickson Alumni Center, Grand Hall
Minutes
April 23, 2015

1. Call to Order and Roll Call

Chair Susman called the meeting of the West Virginia State University (WVSU) Board of Governors (BOG) to order at 12:30 p.m.

Present: Ms. Guetzloff, Dr. Guetzloff, Mrs. Jarvis, Mr. Konstanty, Mr. Lipscomb, Mr. Salyers, Dr. Smith, Mr. Susman, Mr. Swingle, Dr. Thralls, and Mr. Williams. Several members of the administration, faculty, and staff were also present.

2. Verification of Appropriate Notice of Public Meeting

Mr. Konstanty motioned to verify appropriate notification of the meeting, and Mr. Swingle seconded the motion. The motion carried.

3. Review and Approval of Meeting Agenda

Mr. Swingle motioned for approval of the agenda as presented, and Mr. Lipscomb seconded the motion. The motion carried.

4. Review and Approval of Minutes of Previous Meetings

Mr. Lipscomb noted one correction under the Recruitment and Retention Committee report related to attendance. He requested that the minutes be amended to clarify that he was present for the Committee meeting, but unable to attend the full Board meeting. Mr. Swingle motioned for approval of the minutes of the March 19, 2015 meeting as amended, and Mr. Konstanty seconded the motion. The motion carried.

5. Announcements from the Chair

Chair Susman thanked administrators, students, faculty, staff, and fellow Board members for participating in the Higher Learning Commission reaffirmation of accreditation site visit. He said Dr. McMeans and his team did an outstanding job throughout the entire process, and their hard work and dedication are greatly appreciated.

Chair Susman called on President Hemphill for a special presentation. President Hemphill welcomed the women's tennis team and their head coach, John Simms, to the meeting. He said the team members have proven their abilities and talent repeatedly by excelling both on the court and in the classroom. The juniors on this team have won three straight regular season conference championships, three straight conference tournament championships, and three straight NCAA tournament appearances. They have not lost a conference match in three years, which is 33 straight conference match wins. This academic year, returning players were joined by an equally-talented group of freshman student-athletes eager to build upon a winning tradition. President Hemphill introduced to the Board the 2014 Mountain East Conference Women's Tennis Champions, who also appear on the cover of the newest edition of STATE Magazine.

Members of the team were called up individually (Juniors Brittany Franco, Charlotte Sandy, and Diana Cotoros, and, Freshmen Brooke Campbell, Brenda Cumpa, Nina Dillwald, and Christine Johnson), and President Hemphill presented the championship ring, as well as a framed cover of STATE Magazine to each team member. He asked everyone to join in applause to show appreciation and admiration to the team for their hard work and contributions to the University. President Hemphill also recognized Lauren Chambers, a freshman, who was unable to attend the meeting.

Prior to the Board meeting, a resolution was drafted to recognize Mrs. Jarvis for her exemplary service as the classified staff representative on the Board of Governors. Chair Susman read the resolution aloud and asked that a copy be attached to the meeting minutes for the record. Mr. Konstanty motioned for adoption of the resolution, and Mr. Williams seconded the motion. The motion carried. The resolution was presented to Mrs. Jarvis. Following the presentation, Mrs. Jarvis said it has been an honor to serve on the Board, and she expressed appreciation for the support she received during her term as the classified staff representative.

Chair Susman recognized Dr. Guetzloff for receiving a medal in a recent marathon. He also noted that Dr. Guetzloff is currently training to run six marathons in six days.

6. Reports from Board Committees

Institutional Advancement:

Mr. Susman chaired the Committee and presented the report.

- To date, the total number of donors is 939.
- For the campaign, $11.8 million has been raised since it began in 2011.
- University Advancement staff is continuing work on fundraising in athletics; to date, $59,000 has been received this year.
- The third annual Black and Gold Gala will be held on May 9, 2015 at the Charleston Marriott Town Center. The event will be reception style with a brief program honoring the University's staunch supporters, live music, and a dance. Student artwork will also be on display, and Student Ambassadors will assist in greeting and interacting with guests.

Recruitment and Retention:

Mr. Lipscomb chaired the Committee and presented the report.

- Freshman applications for fall 2015 increased 22 percent over last year. In-state and out-of-state applications also increased. Admits increased 40 percent over last year, and confirmations have increased, as well.
- Financial aid packets continue to be issued early.
- The Committee discussed the importance of scholarships as a recruitment and retention tool to assist with financial needs for students to return to school. The Committee also discussed waivers designed to assist students with tuition costs.
- The University is being represented and presenting scholarships within awards assemblies at area high schools, which helps increase the institution's visibility.
- The WVSU Foundation assisted 229 students through scholarships and book vouchers totaling approximately $284,000 this year.

Audit:
Mr. Williams chaired the Committee and presented the report.

- The University completed a routine review of each cash collection point, and there were no findings.
- A campus security audit was completed by an external group at the request of the Higher Education Policy Commission (HEPC), and the University is awaiting the draft report from the audit firm.
- The Committee received an overview of discussions with external auditors regarding GASB 62, specifically classifications on balance sheets.
- An update on faculty housing was provided, and the account is performing well. Additionally, it was reported that the reserves for insurance for the houses are sufficient.

Academic Policies:
Dr. Thralls chaired the Committee and presented the report.

- The Committee received a report from Academic Affairs on various information items.
- The University is awaiting approval by the Higher Learning Commission on the Master of Public Administration program, which was previously approved by the Board.
- Through Committee discussion, there was a consensus that the program reviews for the Master of Science in Biotechnology and the Master of Arts in Biotechnology should be held for further review in anticipation of receiving grant funds for the program. As a result, the program reviews will be brought before the Committee and full Board in June. The program reviews that were approved by the Board this year will be compiled and submitted to the HEPC by the May 30, 2015 deadline. The University will request an extension for the biotechnology program reviews.
- The University received feedback from the HEPC on the Compact Report. The HEPC is asking the University to review specific areas and submit a response by June 7, 2015; however, the University would like to contact the HEPC about submitting its response following the June Board meeting. The Committee agreed and recommended that the University proceed with the request for an extension.
- The Committee received an update on the Higher Learning Commission reaffirmation site visit. The review team was complimentary in many areas and is currently working on the review report.

Finance:
Mr. Salyers chaired the Committee and presented the report.

- The Committee reviewed the March 2015 E&G budget report.
- Line items were reviewed for the different areas, and the majority were under budget for the reporting period.
- The Auxiliary Activity report for March indicates a positive shift in some of the accounts (i.e. housing, dining).

- The Committee requested a full report on accounts receivables, specifically student collections, be provided at a later time to the full Board.
- Information was provided on the proposed Fiscal Year 2016 Budget and 2015-2016 Tuition and Fee Schedule. The Committee voted to recommend approval by the full Board for the proposed Fiscal Year 2016 Budget and 2015-2016 Tuition and Fee Schedule.

7. Possible Executive Session under the Authority of West Virginia Code §6-9A-4 to Discuss Personnel and Legal Matters

Mr. Konstanty motioned for approval to go into executive session, under the authority of West Virginia Code §6-9A-4, to discuss personnel and legal matters. Mr. Swingle seconded the motion, and the motion carried.

A motion to arise from executive session and reconvene into regular session was made by Mr. Williams, and Mr. Swingle seconded the motion. The motion carried. Chair Susman asked for the record to reflect that the Board only discussed items related to the topics listed, that no decisions were made in executive session, and no motions or votes were taken.

8. Report from the University President

President Hemphill said he would like to begin by reporting on last week's site visit by the Higher Learning Commission regarding the University's reaffirmation of accreditation. He acknowledged the Board members for their active participation and strong support during this process. The reviewers were impressed by the level of engagement exhibited by the Board of Governors, as well as the entire campus community. The University will receive the results of the site visit and our status of reaffirmation on accreditation in the coming months. President Hemphill asked everyone to join him in giving a hearty round of applause to Dr. Orlando F. McMeans, the Steering Committee, and all of those who worked so hard to make last week's visit a resounding success.

President Hemphill said he is pleased to report that this Saturday, April 25, 2015, more than 600 members of the State family will participate in the third annual WVSU Cares Day, which is the University's largest community service event. Last year, over 325 students, faculty, staff, alumni, and friends participated and contributed over 1,300 hours of service at designated sites in Kanawha and Putnam counties. Each year, the event grows in terms of volunteers and the impact they make in the local community. President Hemphill applauded Vice President Kitty McCarthy and the team, who worked so hard to identify project sites and recruit volunteers.

President Hemphill said he would like to take a moment to encourage Board members to participate in our upcoming Commencement. The ceremony will be held on Saturday, May 16, 2015 beginning at 10:00 AM and feature Charles Frank Bolden Jr., current Administrator of NASA, a retired United States Marine Corps Major General, and former NASA astronaut, as the Commencement speaker.

a. Presentations

- Item 8.a.i: President Hemphill asked Vice President Kimberly Osborne to provide a presentation on the University's joint application with West Virginia University (WVU) to the Commission on Presidential Debates. Vice President Osborne said this is a collaboration with WVU, the Governor's Office, the West Virginia Division of Tourism, the City of Charleston, Steptoe & Johnson PLLC, and the Clay Center for Arts and Sciences. Following approximately six months of preparation work, the joint application was submitted on March 24, 2015. She noted that the focus of the Debate would be in Charleston; however; it is a statewide event. Both University campuses plan to hold what is known as a Debate Village, which would provide a great opportunity to highlight the institutions and demonstrate civic engagement. Vice President Osborne said the year-long experience is woven into academics and student life. She provided an overview on the selection process; currently, there are sixteen applicants, and four Debate locations will be chosen. The Commission on Presidential Debates will conduct site visits, as well as selection visits, and the selection announcement will be made in October 2015. The West Virginia Commission on Presidential Debates has been formed; it is a 501(c)(3) and joint fundraising venture, with the presidents of both universities, or their designees, serving alongside attorneys from Steptoe & Johnson. Leadership from the WVSU Foundation, the WVU Foundation, and the West Virginia Commission on Presidential Debates continue to have discussions regarding fundraising efforts and the processes therein. There are many benefits to hosting a Debate, including educational enhancements to student learning and their college experience; time well spent in the international media spotlight for the University, city, and state; and long-term University activity and interest.

- Item 8.a.ii: President Hemphill asked Dr. José Ulises Toledo, Associate Dean for Administration in the Division of Research and Public Service, to provide a presentation on the University's English as a Second Language (ESL) and research partnerships with Mexico. Dr. Toledo said a WVSU delegation traveled to Mexico in January and signed MOUs with four prominent universities (Universidad Autonóma De Nuevo Leó, Universidad De Guadalajara, Universidad Autonóma De Coahuila, and Universidad Autonóma Chapingo). These universities have a combined total of 450,000 students. The University's delegation visited facilities and met with administrators, faculty, and students. The group also participated in a forum with faculty members and learned about additional potential research partnerships. Dr. Toledo said the University's first cohort of Mexican ESL students will arrive on May 31, 2015. Fifty-eight individuals, including students, faculty, and administrators from seven Mexican institutions, will be on campus for five weeks studying the English language and learning about life in the United States. Students for this first cohort are part of Mexico's *Proyecta 100,000* initiative, which provides financial support for students

and others studying in the U.S. and Canada through 2018. In turn, Mexico hopes to have U.S. students and faculty visit Mexico for study and research. Another cohort of Mexican students, from the University of Nuevo Leon, will arrive in early July and will be on campus for four weeks. Orientation, academic courses, time with conversation partners, and taking part in Charleston area summer events and activities will be included in ESL programming. WVSU students, faculty, and staff will be involved in greeting ESL students and serving as volunteers.

- Item 8.a.iii: President Hemphill asked Assistant Vice President Tom Bennett to provide a recap of the 2015 legislative session as it relates to higher education. Mr. Bennett distributed copies of a higher education summary of the 2015 legislative session that he developed for the Board of Governors. He referred to the chart that provides a breakdown of the funding allocation to WVSU as it progressed through the legislative process, which includes the University's base funding in addition to the state land-grant match. The University was also allocated $500,000 in one-time funds with the passage of House Bill 3022 on the last night of the legislative session; however, this funding was later line-item vetoed by Governor Tomblin.

  Mr. Bennett proceeded with an overview on the following pieces of legislation that were passed during the session affecting higher education. Senate Bill 439 relates to higher education personnel; Senate Bill 425 relates to investments by Marshall University, the West Virginia School of Osteopathic Medicine, and West Virginia University to invest non-appropriated funds into their private foundations; Senate Bill 577 allows higher education governing board to invest certain funds with nonprofit foundations; Senate Bill 455 relates to public higher education procurement and payment of expenses; Senate Bill 559 relates to social work provisional licensing; House Bill 2005 relates to alternative programs for the education of teachers; House Bill 2535 relates generally to suicide prevention training ("Jamie's Law"); House Bill 2645 expands the availability of the Underwood-Smith Teacher Loan Assistance program; House Bill 2674 allows home-schooled students to be eligible for the PROMISE Scholarship without taking the GED test or its equivalent; House Bill 2780 enhances the ability of campus police officers at public colleges and universities to perform their duties; House Bill 2867 requires recommendations for higher education course credit transfer; House Bill 2884 simplifies the BOG training deadlines; and House Bill 2976 expands the eligible master's and doctoral level programs for which a Nursing Scholarship may be awarded.

b. University Reports Forwarded by Board Committees

- Item 8.b.i: President Hemphill asked Vice President for Business and Finance Melvin Jones to provide the budget report. Mr. Jones said the E&G report is through March 31, 2015, and is a modified cash basis. The general revenue target is 75 percent, and expenses are at 72.98 percent. Mr. Jones

provided an overview of the actual percentages for all of the areas, as follows: Academic Affairs (74.76 percent) Student Affairs (95.44 percent), President's Area (54.32 percent), University Relations (76.58 percent), Physical Facilities (71.42 percent), University Advancement (76.47 percent), Finance (77.67 percent), and College-Wide (55.30 percent). Mr. Jones referred to the footnotes listed at the bottom of the report with additional information on department budgets. He said Student Affairs is over budget because of new recruitment and retention efforts (see note 5); this area continues to be the priority area to increase enrollment numbers. Dr. Guetzloff inquired about the increase in the supplies budget for Student Affairs compared to last year. Mr. Jones stated there was not a baseline previously; however, the budget proposed for next fiscal year shows additional revenue that will go toward Student Affairs and offset some of these expenses. For the auxiliary accounts, Student Union Operation, Housing, and Dining Food Services have positive net activity. The Athletics accounts remain in a deficit. The Parking account is continuing to trend positively. Mr. Jones said the figure listed in the report for the Bookstore will be reviewed following the meeting because the deficit showing is not accurate.

- Item 8.b.ii: President Hemphill asked Mr. Jones to present information for the proposed Fiscal Year 2016 Budget and 2015-2016 Tuition and Fee Schedule. Mr. Jones said the budget is based on the proposed 6.9 percent tuition increase. The proposed 2015-2016 Tuition and Fee Schedule indicates an additional $217 per student for resident, $507 for non-resident, and $396 for metro per semester. Graduate students would pay an additional $239 for resident and $559 for non-resident per semester. Mr. Jones noted two new fees in the proposed 2015-2016 Tuition and Fee Schedule. A library fee has been restructured to increase funding for library books and resources; the fee is $75 per semester for full-time students, and 100 percent of the revenue from the fee will go toward the Library. There is also a new $40 orientation fee to help defray the cost of orientation; this is a one-time flat fee and is for new students only. Other fee adjustments are mostly small and under $5. Mr. Jones said the proposed schedule also includes a fee increase for Sullivan Hall, which was recommended by the Finance Committee.

  Chair Susman called for a motion on the proposed 6.9 percent tuition increase and fees as outlined in the documents. Mr. Swingle motioned for approval by the Board for the Fiscal Year 2016 Budget and 2015-2016 Tuition and Fee Schedule, and Mr. Williams seconded the motion. Prior to the vote, several Board members commented for the record. Dr. Guetzloff inquired about increases that would be shifted, i.e. Athletics, and Mr. Jones stated that the information could be provided following the meeting. Dr. Thralls expressed his continued concerns with increasing tuition and fees to support the budget. He would like to see the University adopt a policy or

procedure related to tuition and fee increases that would move from the current incremental approach to a more policy-based method to increase revenue. Through Board discussion, there was a consensus that it would be challenging to generalize an approach in policy because of how the state budget system operates. Dr. Thralls clarified that he would not expect a set percent to be identified for coming years; however, he feels that parameters should be set and a plan be put in place that would provide a vision over time, as well as cause the University to look at where tuition and fees have been, currently are, and could be in the future as part of the financial future. The Board also discussed the passage of the budget, which included additional funding for the University that was subsequently vetoed by the Governor. There being no further discussion, a vote was taken, and the motion carried.

9. Other Matters

No other matters were brought before the Board for discussion.

10. Next Meeting Date

Chair Susman said the next Board of Governors meeting will be held on June 18, 2015.

11. Adjournment

With there being no further business, the meeting adjourned at 2:53 p.m.

Respectfully submitted,

L. Vincent Williams
Secretary

Approved: _____
Tom Susman
Chair

WEST VIRGINIA STATE UNIVERSITY BOARD OF GOVERNORS
RECOGNIZES THE DEDICATED AND MERITORIOUS SERVICE OF

DEBRA ANN JARVIS

WHEREAS, Debra Ann Jarvis, Interim Associate Registrar, retired in the Spring of 2015 following 30 years of exemplary service to West Virginia State; and

WHEREAS, Mrs. Jarvis arrived at West Virginia State in 1974 as a transfer student, and was employed as a student worker in the Office of Registration and Records, and subsequently served in positions of increasing responsibility as Registration Clerk, Administrative Assistant to the Registrar, and Interim Associate Registrar; and

WHEREAS, Mrs. Jarvis received a Bachelor of Science Degree in Business Administration from West Virginia State in 1997; and

WHEREAS, Mrs. Jarvis worked in various capacities for more than 60 Commencement ceremonies during her tenure at West Virginia State; and

WHEREAS, Mrs. Jarvis has earned the admiration and respect of countless students and colleagues for her dedication, collegiality, enthusiasm, professionalism, sense of humor, and hard work to West Virginia State students, as well as the entire campus community; and

WHEREAS, Mrs. Jarvis is a staunch advocate for veterans and provided outstanding service as the Veterans Affairs Coordinator at West Virginia State from 2007 until her recent retirement, during which time the University was recognized as a Military Friendly Institution, and Mrs. Jarvis received a Yellow Ribbon designation; and

WHEREAS, Mrs. Jarvis was elected by her peers to serve as the Classified Staff Council representative on the Board of Governors and faithfully provided excellent leadership and service to the Board of Governors from July 2013 through April 2015; and

WHEREAS, Mrs. Jarvis served as a valued member of the Audit, Finance, and Recruitment and Retention Committees; and

WHEREAS, Mrs. Jarvis, during her tenure, demonstrated a deep passion for the University's core values, mission, and vision; and

WHEREAS, Mrs. Jarvis actively communicated with fellow members of the classified staff and state and local leaders, as well as the entire University community, on issues of vital importance to staff throughout her tenure on the Board of Governors.

THEREFORE, BE IT RESOLVED, that the West Virginia State University Board of Governors expresses its heartfelt gratitude to Mrs. Debra Ann Jarvis for her dedicated and meritorious service to the University.

Tom Susman, Chair
West Virginia State University Board of Governors

Brian O. Hemphill, Ph.D., President
West Virginia State University

Agenda Item 5.a. **Action**
June 18, 2015

Resolution Presentation

Agenda Item 5.b. **Action**
June 18, 2015

Proposed Fiscal Year 2016 Meeting Dates

As required by West Virginia Code, the Board of Governors must hold a total of six meetings per year with an annual meeting during the month of June for the purpose of electing officers. As outlined in the Board of Governors Bylaws, specifically Article I (Meetings), Section A (Meetings), Items 1 through 7, the following are required:

A. Meetings

1. The Board of Governors shall hold a minimum of six (6) meetings during each fiscal year, to include an annual meeting each June.

2. Notice of meetings shall be in accordance with the Open Governmental Meetings Act.

3. Of the twelve (12) voting members of the Board of Governors, seven (7) shall constitute a quorum.

4. Special meetings may be convened by the Chair or upon petition of a majority of the members.

5. Meeting procedures shall be in accordance with Robert's Rules of Order subject to the suspension of any rule by a two-thirds vote of the Board.

6. An annual meeting shall be convened each June for the purpose of selecting a Chairperson and other officers.

7. The Board of Governors shall provide an opportunity for administrators, faculty, students and classified staff to discuss various issues no less than one (1) time per year. The viewpoints of the various constituencies should be presented by a person or persons selected by those constituencies. That person shall be someone other than the constituency's board representative.

For Fiscal Year 2016, the below meeting dates are proposed for the Board's consideration and review:

September 3, 2015
September 4, 2015 *(Retreat)*
October 29, 2015
January 27-28, 2016
March 17, 2016
April 28, 2016
June 16, 2016

Agenda Item 5.c. **Action**
June 18, 2015

Fiscal Year 2016 Election of Officers

As required by West Virginia Code, the Board of Governors must hold an annual meeting during the month of June for the purpose of electing officers. As outlined in the Board of Governors Bylaws, specifically Article I (Members), Section C (Elections) and D (Officers), Items 1 and 2, the following are required:

C. Elections

1. All elections shall be held no later than the 30th day of June preceding the commencement of the term.

2. The Board of Governors shall elect one (1) of its appointed lay members to serve in the capacity of Chairperson in June of each year. No member may serve as chairperson for more than four (4) consecutive years.

D. Officers

1. The officers of the Board shall consist of Chair, Vice Chair, and Secretary.

2. Officers shall serve for a term of one (1) year, beginning July 1st and ending June 30th. The Chair may not serve more than four (4) consecutive years. The Vice Chair and Secretary may not serve more than two (2) consecutive terms in the same office.

Agenda Item 5.d. **Action**
June 18, 2015

Approval of Presidential Review Committee

As outlined in the Board of Governors Bylaws, specifically Article IV (Committees), Section H (Presidential Review Committee), Items 1 and 2, the following are required:

H. Presidential Review Committee

1. The West Virginia State University Board of Governors shall yearly form a "Presidential Review Committee," appoint a chairperson, and elect four (4) additional members to the committee from the Board of Governors at the annual meeting to be held each June; and

2. The committee shall provide oversight of the university's adherence to Board of Governors Policy #61, Employment and Evaluation of the President, specifically the annual, tri-annual or comprehensive review of the president.

Agenda Item 8.a.i. **Action**
June 18, 2015

Program Review – Biotechnology, M.A

PROGRAM REVIEW Committee
Committee Recommendation Form

2014-15

Program: Master of Arts in Biotechnology **Date:** February 6, 2015

Type of Review: X Comprehensive Self-Study
Follow-Up / Progress Report

Recommendation to the Board of Governors:

x **1.** Continuation of the program at the current level of activity with specific action as described in the Rationale section of this Form;

2. Continuation of the program at a reduced level of activity (e.g., reducing the range of optional tracks, merging programs, etc.) or other corrective action as described in the Rationale section;

3. Identification of the program for further development (e.g., providing additional institutional commitment);

4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;

5. Discontinuance of the Program according the provisions of Higher Education Policy Commission (Section 8.1, Series 11, Title 133)

6. Other. Specify.

Rationale for Recommendation:

The Program Review Committee recommends the Master of Arts in Biotechnology be continued at the current level of activity.

The program has a number of strengths. Its graduates from the review period are in professional school in fields related to biotechnology. The program has received steady financial support from research grants to faculty and a STEM-fields masters grant from U.S. Department of Education Biotechnology faculty members demonstrate commitment to research and other professional developments activities. In addition to the research activities central to the curriculum, the program also offers graduate students opportunities to teach undergraduates, primarily in lab sections. All the above makes the program unique among others in the regions.

The program has a few weaknesses, one of which is the absence of a useful assessment program that generates essential data for analysis and program improvement. It also lacks access to adequate number of full-text academic journals from the library. Though there are few graduates, MA students take courses that must be offered for MS students, and it is traditional in the sciences to have both thesis and non-thesis options.

Planning for best use of resources would be enhanced with better, more transparent information on potential funding from lab fees and "indirect" funds from grants.

The Committee recommends a formal Follow-Up/Progress Report on program assessment, including data, and on program resources, due December 1, 2017.

Place a check if additional sheet(s) attached ☐

Signature of Committee Chairperson

_____

West Virginia State University

Comprehensive Program Review

for

Master of Arts in Biotechnology

submitted to

The Program Review Committee

Summer 2009 through Spring 2014

Table of Contents

III. Viability

IV. Necessity

Appendices

Exhibits

I: Program Description

A. Program Purpose Statement

The purpose of the West Virginia State University (WVSU) Biotechnology (BT) Graduate Program is to provide cross-disciplinary education and training in twenty-first century concepts and biotechniques to a diverse group of regional, national, and international students. The BT Program prepares a cadre of professionals for careers in the diverse industries being revolutionized by Biotechnology and prepares its graduates for advanced education. Through coursework, laboratory work, and other academic experiences such as internships, students advance their critical thinking skills, and master the technical skills necessary to solve complex biological problems.

The Master of Arts (MA) degree offered in the BT Program differs from the Master of Science (MS) degree in that the MA does not require a thesis (research, writing, defense and public presentation), but instead requires a successful comprehensive examination and six more credits of elective coursework.

B. Program Outcomes

Program Objectives

The goal of the Biotechnology Graduate Program is to provide instruction in the broad field of Biotechnology, as well as specialized training in the current concepts and technological advances of a sub-discipline of Biotechnology. The BT Program prepares students for diverse careers in the Biotechnology, Pharmaceutical, Environmental Sciences, and Health Care industries, as well as Education.

C. Consistency with University Mission

This Program Review addresses the WVSU Mission Statement as it existed during most of the review period.

The crux of the WVSU Mission was: "The University, a living laboratory of human relations, is a community of students, staff, and faculty committed to academic growth, service, and preservation of the racial and cultural diversity of the institution. Our mission is to meet higher education and economic development needs of the state and region through innovative teaching and applied research." The Biotechnology Program is fully consistent with this mission, and highlights the fulfillment of both its letter and its spirit. See Exhibit A, Mission Statement, Biotechnology Graduate Program.

It is difficult to consider the MA degree of the BT Program (with three students enrolled in the time frame of this review) separately from the MS degree (with 52 students enrolled). The three MA students were fully integrated with their fellow MS students in all facets of their degree work, except the thesis and comprehensive exam.

The BT program at WVSU is among the most diverse programs on campus. For example, out of the 55 MA and MS students who were (or are) enrolled in the BT Program during the period of this review, 28 were US citizens and 24 were international students. The internationals came from India, Nepal, Mexico, Jamaica, Bangladesh, Iran, and Nigeria. There were 31 males and 21 females. All were in their twenties to early thirties. Of the U.S. citizens, eight were African-American or mixed race.

The program also meets higher education and economic development needs of the state and the region. For instance, of the 3 MA students enrolled during the period of this review, two graduated. See Exhibit B, Biotechnology Graduate Students.

As evident from the Faculty Data Sheets, our faculty members are innovative teachers and applied researchers. Coursework is tailored to be applicable to the up-to-date laboratory techniques used in the Program, and students' extensive hands-on learning experiences are as innovative as the techniques themselves. The expertise of WVSU BT Faculty is supplemented by collaborations with Affiliate Faculty from around the region and guest researchers from around the world. Students learn, do, and teach, providing a critical mass of knowledge and mutual support across the BT Program. One of the features of the WVSU BT program is that many of our students publish articles in research journals. See Exhibit C, publications from the Biotechnology Graduate

Program. The $9.5 million in externally-funded grants speaks for itself (see Exhibit D, grants awarded to Faculty of the Biotechnology Graduate Program). This record speaks to the vitality, collegiality, and productivity, and demonstrates by its success in living the mission of WVSU.

The program has more than doubled the number of graduates during this period. During the previous five-year Program Review, 13 students earned MA and MS degrees (the program reviews were combined). In this five-year period, there were 2 MA graduates out of a total of 3 students.

D. Previous Reviews and Corrective Actions

The Biotechnology Graduate Program was reviewed in 2009. See Exhibit E for response from the 2009 Program Review of the Biotechnology Graduate Program. The committee recommended the BT program be continued at the current level with specific action.

There were three areas to improve from the previous program review: 1. lack of program assessment, 2. insufficient space for further growth, and 3. insufficient administrative support.

A Plan of Correction was prepared by the BT Program to address the deficiency that the BT Program could do about: the lack of a proper assessment regimen. The Plan of Correction is delineated in Exhibit F, The BT Program's assessment for the period of this review is covered below in Appendix II-C, Assessment.

E. Accreditation Information

1. Accreditation Organization

The Biology Department, as part of WVSU, is accredited through the Higher Learning Commission of the North Central Association of Colleges and Schools. The BT Graduate Program does not have programmatic accreditation.

2. Year of Accreditation

NA

3. Accreditation Status

NA

4. Accreditation Organization Report

NA

5. Deficiencies and Corrective Actions

NA, but see Section II-C, Assessment, below.

Section II: Adequacy

A. Curriculum

Appendix II-A lists the BT Graduate Program's course curriculum. The Biotechnology Graduate Student Manual (Exhibit G) addresses BT Program curriculum in greater detail. The manual is updated every academic year. It contains curriculum, policies, procedures, forms, explanations, FAQs, etc.

The MA degree requires five core courses totaling 12 credits, another 18 credits of electives, and a successful comprehensive examination.

We divide Biotechnology into two concentrations: Organismal / Environmental Biotechnology, and Molecular / Microbial Biotechnology. We offer electives for both concentrations every semester. The student, with his/her committee, defines a formal "Plan of Study" to help each student get the electives he/she desires.

The central, most significant element of the MA education is the coursework, which is not only assessed on a course-by-course bases (ex. graded work in courses), but is also assessed by a comprehensive examination. This must be completed no later than Week 9 of the student's final semester. Comprehensive exams include all graduate coursework taken by the student. The faculty member who taught each course (or if he/she is not available, BT faculty members possessing expertise in that area) write and grade questions for that topic. The examination is graded pass/fail.

B. Faculty

Faculty Data Sheets for everyone who taught in the BT Graduate Program during the period of this report are in Appendix II-B. Note that the Biology Department during this review period had thirteen members. Out of those thirteen faculty members, eleven have taught in the BT program. All BT faculty held doctorate degrees in fields directly applicable to Biotechnology with the farthest afield being an Organic Chemist (WVSU Chemistry Department, tenure-track) who taught one section of Spectroscopy. Of the Eleven, nine held tenure at WVSU during the period of this report. All of the BT faculty members also taught undergraduate courses. Typical teaching load for Graduate Faculty is nine credit hours.

The BT Program is administered by a Program Coordinator, who was also the Chair of the Biology Department until Fall 2011. The Chair is given one third teaching release time, and the BT Program Coordinator has none.

The BT Program Coordinator reports to the Dean of the College of Natural Science and Mathematics (CNSM).

In sum, the BT Program has no additional administrative support beyond what is already in place to run the Biology Department or the CNSM.

Graduate Teaching Assistants

Graduate Teaching Assistants are addressed here because they teach as part of their education. All BT students are required to teach at least two sections at some point in their stay. As MA students do not take GRAs, they typically teach more than their MS fellows.

Each semester of this review period, the BT Program had eight to ten Graduate Teaching Assistants (GTAs) These GTAs teach three sections of the lab components of courses, mostly General Education or lower-level Biology courses.

Our GTAs are supervised by the Instructor of Record, who is to file a formal observation report each semester. The Program Coordinator informally observes regularly, and formally observes all new GTAs in their first semester of teaching, and as warranted thereafter. In BT Graduate Faculty meetings, we evaluate a GTA's performance in a semester to judge if there is any issue that would affect the decision to renew that person's GTA for the next semester. Exhibits H, I, and J contain the forms used for these assessments and an example assessment.

Practically all new graduate students are supported on GTAs in their first semester. New students are strongly encouraged to take the elective "Seminar for Teaching Assistants (BT 501)." Students being enrolled in this course allow the teacher (usually the BT coordinator) to get to know, mentor, and keep tabs on new students. In several semester, this course was also used as a platform for students to evaluate (and recommend improvements to) the BT Program. See Exhibit K, recommendations from "Seminar for Teaching Assistants," Fall 2012; Exhibit L, recommendations from "Seminar for Teaching Assistants," Fall 2013.

Graduate Teaching Assistants are not evaluated using the campus-wide Faculty Evaluation instrument. However, many GTAs take it upon themselves to conduct such evaluations. As these are not University-approved surveys, they are not entered into the students' files or otherwise used by the Program. But our GTAs benefit from them, and it speaks well of their professionalism that they seek out their own students' feedback.

Biotechnology Staff

Although the BT Program has no exclusive support staff, we share staff as part of the College of NSM.

Academic Program Associate (CNSM) Ms. Audrana Austin handles financial matters. She also covers much of the clerical work involved in applications to the program, and maintains students' files.

An Assistant to the Dean of the CNSM position was created from Title III, Research and Development (R&D) money, and was funded in the three academic years from Fall 2011 through Spring 2014. Ms. Leah Turner held the position in the first two years, and Ms. Allison Meadows in the last. Perhaps 25 percent of this person's time was devoted to the BT Program, doing outreach, Program assessment support, supporting Ms. Austin with applications, and informally advising BT students. The position was canceled for financial reasons.

Biology Department Academic Lab Manager Ms. Mandy Bailey does some of the set-up work for BT teaching labs. Some semesters, she also informally supervises a few GTAs who help set up undergraduate labs.

C. Students

1. Entrance Standards and 2. Entrance Abilities

The entrance standards of the Biotechnology Graduate Program are a direct gauge of the abilities we expect of incoming students. Students must enter the program with a good deal of preparation in the natural sciences. Biotechnology requires a broad content background in biology, chemistry, applied mathematics and physics, as well as the ability to conduct scientific work (the Scientific Method) and communicate it at levels of clarity and sophistication necessary to participate in the world of science.

The BT Program requires that incoming students have a baccalaureate degree in a field related to Biotechnology, with a GPA of at least 3.0 (on a 4-point scale) both over-all and in the natural sciences. Because international applicants often come from institutions that do not precisely conform to this model, we require that their post-secondary transcripts be evaluated by an independent agency (such as World Educational Services) and certified to be the equivalent of these requirements.

Applicants must have GRE scores of at least 140 verbal and 150 quantitative. For all international applicants, we evaluate English language proficiency by requiring TOEFL scores of at least 80 or IELTS scores of at least 7. We follow this up with Skype interviews, evaluated subjectively by several BT faculty, staff, and occasionally graduate students. Exhibit M shows the questions we ask during Skype interviews.

Almost all applicants need financial support to attend graduate school. Therefore, although we may accept applicants into the program without graduate assistantships, in practice we make both decisions as one. That is, we only accept applicants if they are acceptable as GTAs. This especially drives our decisions with respect to English language proficiency. As the program has matured, we have gotten ever-more stringent in this.

As the BT faculty evaluate applications, we select for applicants who have done well in coursework areas that provide the foundation for success in Biotechnology, especially chemistry, genetics, and cell biology. We prefer applicants who have research experience, but we frequently accept students whose research backgrounds are inadequate. This is especially prevalent among international applicants, as modern Science research is expensive and beyond the means of their undergraduate institutions.

Each semester, as the Biotechnology faculty select the best applicants from the pool. Occasionally, we accept applicants who do not quite meet the above requirements. We are informed by applicant's references, perhaps a special skill the applicant would bring, or some compelling personal story. Although we would make acceptance

decisions based on majority vote of Biotechnology Core faculty, in practice we have always hammered out consensus decisions. Details of the applications, our ranking thereof and our final decisions are available in the minutes of Biotechnology faculty meetings and application files kept in the offices of Academic Program Associate Ms. Audrana Austin and Program Coordinator Dr. Richard Ford.

3. Exit Abilities

Abilities essential across the field of Biotechnology are learned in the core Biotechnology curriculum. These abilities are measured by student performance in these courses. Appendix II-A shows the Biotechnology Program curriculum. In the required 12 credits of core courses, the Biotechnology Graduate Program ensures that our students learn the theory and skills that our graduates will need in any Biotechnology situation. Specific student outcomes given in syllabi of these courses, available in the Biology main office (Hamblin Hall 101)

By requiring MA students take 24 credits of approved elective courses, we provide deeper learning in sub-disciplines / specialties of Biotechnology. The program has two concentrations: Organismal/ Environmental and Molecular / Microbial. See Appendix II-A program curriculum. We recognize that the field of Biotechnology (and students' interests) does not divide neatly into these two (or any) sub-disciplines. For MA students, the BT Program Coordinator is automatically the advisor, although the student is also mentored by faculty in the student's area of interest. In a student's second semester, the student and advisor prepare a formal "Plan of Study". As the student should stay at in the program for only about two years, and as elective courses are not offered every semester, this plan ensures that course scheduling decisions are made proactively. In addition, in the Plan of Study the advisor may authorize that a valuable but non-program course be counted as a graduate elective for that student.

Exit abilities of MA students are comprehensively assessed in the comprehensive examination. Records (questions, answers and scores) are available in the Biology office.

In the time frame of this review, students seeking the MS degree had a 68% graduation rate. Although a statistically meaningless sample size, the three students seeking the MA degree had a 67% graduation rate; one left the program early to enroll in medical school. We view this as an indicator of our success. In the previous five-year BT Program review period (Fall 2004 - Spring 2009), we had two MA students graduate; one other left early for medical school.

Students choose the MA track for one of two reasons. Two of the MA students joined the BT Program as a stepping stone toward acceptance into professional schools (medical and optometry school) and didn't intend to do research in their careers, and the other started in the MS track but bailed out when the research didn't go well. Both are useful functions for the MA degree offered through the BT Program.

4. Graduates

Another measure of the BT Program's success is the rate at which our graduates move to the next step in their careers, either a job in the field or graduate / professional school. The success of students who sought the MS degree is presented in the MS Program Review. Both MA graduates are in professional schools in fields related to Biotechnology.

Whether students complete or not, many (particularly U.S.) students entered the program as preparation for medical or dental school. So if a student gets an early medical school offer, he/she may see no reason to delay entry by staying at WVSU. That may look like a failure for the program (in a lower graduation rate), but it's a positive for the student, one likely made possible by the program.

D. Resources

1. Financial

A proportion of money from lab fees (undergraduate and graduate combined) was used to fund graduate education. Biotechnology research is expensive in terms of equipment (see below) and consumable supplies.

When the BT Program was created, we were adamant that the program not be a burden on the Biology undergraduate program. See Section II G, Program Weaknesses, below.

Over the five-year period of this review, there were three MA students (out of 55 total Biotechnology students), one of the three switched from MS to MS only in her last semester. MA students do not conduct thesis research, which can be costly. They take six more credits of electives than their MS classmates, but this does not require additional courses. Because graduate courses rarely fill to their theoretical maxima, the MA does not require additional sections or faculty. Therefore, the additional costs of providing students with an MA option are very minimal.

All three MA students were supported by Graduate Assistantships. Graduate Assistantships include a stipend of $12,000 per two semesters and full tuition support. Graduate Teaching Assistantship stipends were covered by funding from the HBCU Master's grant. Graduate Research Assistantship stipends (and other educational / research needs) were funded by USDA Evans Allen formula funds and/or by grants written by BT faculty. All tuitions were covered by HBCU Master's grant funds.

2. Facilities

The Biotechnology Graduate Program is located in Hamblin Hall. A few research labs have space either at the Douglass Institute on campus or at other locations in the Kanawha Valley. The Program shares all space and equipment with its parent administrative unit, the WVSU Biology Department. Nothing is dedicated to the one nor restricted from the other.

Space

The Biotechnology Program is housed in Hamblin Hall, which it shares with Computer Services, the Physics Department, the Chemistry Department, the Biology Department, the Douglass Institute, and College of NSM offices. The original building was completed in 1952. Renovations and an addition were completed in 1989. The Program has a relatively small footprint in terms of lecture classroom space. The main difference between the rooms it uses versus those that the Biology Department uses is that the graduate courses don't use Hamblin Auditorium or H107 for course-related purposes. It shares classroom space with the Biology Department, and Chemistry Department in H002 (Hamblin Hall conference room) and H005. The Program uses H002, H134, H140, H203, H205, H209, H218 for lectures. It uses H134, H140, H203, H205, H209, H218 for teaching labs. Everyone in Hamblin Hall shares the computer lab and common areas. Details of the footprint of the Biotechnology Graduate Program in Hamblin Hall are available upon request.

The only additional space used exclusively by the BT Program is the desk/office space assigned to graduate students. We give preference to Graduate Teaching Assistants because they need a place to meet their students. Any remaining space goes to Graduate Research Assistants for whom their advisors can't find room in their labs. To date, we've always found a desk for all students, although conditions have often been tight.

The BT Program has increased its footprint only by making increasingly better use of existing space. The ability of the Program to grow its MS enrollment is pretty much at its limit. Exhibit P shows instructional and research facilities used by the Biology Department / Biotechnology Graduate Program. However, there is capacity to grow the MA program.

Equipment

The BT Program has access to a lot of equipment, most of it quite up-to-date, sophisticated, and expensive. Exhibit Q is a rough list of equipment in the Biology Department / Biotechnology Graduate Program.

The BT Program shares its equipment with the rest of the CNSM, especially the Biology Department. Most equipment was purchased by grants written by individual BT faculty members, who (understandably) supervise their use. The BT Program is proud of the extent to which our students (and undergraduates, too) actually use the equipment; it's not kept "safe" from student use. Personnel from other institutions (scientists and students) remark on this.

Equipment maintenance and service agreements for up-keep remain issues, as funding for these purposes is not always provided for.

The BT Program has a very good arsenal of equipment with which to do (and train students to do) up-to-date Biotechnology. Fortunately, our outstandingly productive BT faculty continually work to update and upgrade equipment for the program.

E. Assessment (Student and Program Levels)

During the period of this review, the BT Program had two formal assessment plans. One was set up as part of the Plan of Correction from the previous program review; see Exhibit F, Plan of Correction resulting from the 2009 Program Review of the Biotechnology Graduate Program. Appendix II-C shows the 2009 assessment plan.

The other plan, implemented in 2012 after being advised to abandon the 2009 plan, was a significant re-working of the BT Program's assessment plan. Exhibit R shows the assessment plan (including Program Learning Outcomes) for the Biotechnology Graduate Program, 2012. Exhibit S shows the assessment map for the Biotechnology Graduate Program, 2012. Exhibit T shows the assessment timeline for the Biotechnology Graduate Program, 2012.

1. Student Outcome Assessment Plan

In the 2012 plan, there were five Program Learning Outcomes:

> Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics;
>
> Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline;
>
> Demonstrate an understanding and proficiency in one of the specialized areas of study: organismal/environmental or molecular/microbial;
>
> Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them; and
>
> Demonstrate the ability to effectively communicate verbally and in writing to the intended audience;

As well as three WVSU Guiding Values:

> WVSU GV 1: Academic Excellence
>
> WVSU GV 2: A core of student learning that includes effective communication, understanding and analysis of the interconnections of knowledge, and responsibility for one's own learning
>
> WVSU GV 3: Development of human capacities for integrity, compassion, and citizenship.

The curriculum map (Exhibit S) indicates which specific objectives were to be assessed and where in the curriculum that would occur. The timeline for administering these assessment instruments is best described graphically, as in Exhibit T.

Assessment instruments for the 2012 plan were things BT students were already doing as graded assignments in core BT courses (written lab report, independent project design, written grant proposal, oral presentations, final papers) and already doing as part of their MS thesis work (written research proposal, public oral presentation of thesis). Assessment instruments that were embedded in courses were assessed by the instructors of those courses, scored as course assignments (but not as per the assessment plan) and reported only to the Registrar as part of the final course grade. Assessments of instruments embedded in thesis work were done by the students' thesis advisors and their thesis committees, were scored pass/fail, and were recorded only as the

student being recommended (or not) for a diploma. These assessments were not otherwise scored, and data was not collected by the BT Program for formal program assessment purposes.

Additional assessment instruments included formal teaching evaluations.

2. Use of Assessment Data

This is where the BT Program assessment plans (2009 and 2012) broke down. No one collected assessment data from the individual BT Program faculty, much less organized it for use. So there's not much to report here. Assessment and improvement occurred, but not in the comprehensive, quantitative, and reportable ways that satisfy program reviews. As scientists, we should understand the need for data-based decisions.

The breakdown had two main causes. The first was that we just didn't understand how to do program assessment. In that, new campus assessment leadership has helped immensely, and that's no longer a roadblock. The second cause was (and may continue to be) the lack of faculty and staff time needed to do proper assessment. The BT Program's Plan of Correction from the 2009 Program Review (Exhibit F) recommended personnel time be allocated to assessment. The Assistant to the Dean of the CNSM position gave some support, but assessment was only a fraction of the job description. The position no longer exists. This is labor-intensive, and the necessary personnel time has to come from somewhere.

There are, however, examples of assessment resulting in change, albeit not part of the BT Program assessment plan. As a graded assignment in the course Seminar for Teaching Assistants (BT 501), BT Program students have been asked to make recommendations to improve the program. In Fall 2012, the members of BT 501 drew up a list of proposed improvements for the WVSU Biotechnology Program (Exhibit K). In Spring 2013, BT 501 made a case for WVSU to offer courses and assistantships during the summer months. In Fall 2013, the new grad students focused on Shelter in Place (SHiP) safety at WVSU (Exhibit L). Individually and as a group, these graduate students demonstrated many of the qualities that are so important in professional life. Although these recommendations came from students new to the BT Program, they were encouraged to (and did) discuss things with veteran students.

Exhibits K and L contain these recommendations. Items we were able to enact included team-teaching assignments for GTAs, parking close to Hamblin Hall for GTAs and GRAs, and better scheduling of BT 501. For other items in which concrete change wasn't achieved, awareness was raised, leading to some improvements; examples include assigning GTAs to more lower-level teaching assignments, better library access, including more Bioinformatics in courses, better lab manuals. Recommendations we have not yet been able to accomplish include the entire range of recommendations about Shelter in Place.

The BT Program used formal evaluations of teaching for quality control and improvement. These included 1. campus-wide Faculty Evaluations, administered to BT students to assess their instruction in BT coursework; 2. evaluations of GTAs by the Instructor of Record in the course(s) they taught; 3. formal observations of (particularly) new GTAs by the BT Program Coordinator; and 4. similar evaluations designed by GTAs themselves and administered to their own students. See Exhibits H, I, and J, respectively; an example of formal evaluation 4 is not represented.

Exhibit U shows the assessment report for the Biotechnology Graduate Program for Academic Year 2013-2014, as part of the University's self-reflection.

Exhibit V shows the new assessment plan for the Biotechnology Graduate Program, 2014. As this was designed and implemented in Fall 2014, it is beyond the scope of this program review. We will do our best to make it work to its intended use.

3. Graduate and Employer Satisfaction

In the period under review, the goal was to develop an employer and an alumni survey, and to use the BT Program web site to administer it. This was not done, in part because the BT Program did not have sufficient access to its own web site. Data derived from this would have been useful to the BT Program and in this program review. As of Fall 2014, the BT Program Coordinator was given permission to run the web site, and hopes in

Spring 2015 to get trained and do it. A variety of polls, including employer and alumni surveys, will be a regular feature on the BT Program web page.

F. Advisory Committee

As part of the plan of correction from the 2009 Biology and Biotechnology Program Reviews, an advisor committee was formed. This "Committee for Expectations, Standards and Assessment" was enlisted in Fall 2009, and met formally (i.e. agenda and minutes) five times from February 2010 through February 2012. The 13 members included faculty from Marshall, WVSU staff, faculty, and students (graduate and undergraduate), two MDs, and a WV DEP Environmental Biologist (see Exhibit W, Committee on Expectations, Standards and Assessment members. This single committee worked with both the Biology Department and the BT Program, and focused most of its attention on Biology.

Exhibit X is a list of the committee's recommendations over two years, and the status of those recommendations. As with the BT 501 student recommendations, it's easier to make recommendations than to enact them. Successes for the BT Program in this regard were limited to web site improvements and establishment of a social media (Facebook) presence. Perhaps the biggest disappointment was with respect to the goal of having the committee become engaged in program assessment. The committee wasn't as interested in that as in other tasks.

After approximately two years, the committee seemed to lose interest, and was discontinued until a better effort could be launched.

G. Program Strengths and Weaknesses

Strengths

1. The BT Program has excellent faculty and staff (see Section II B, above). The Gus. R. Douglass Institute on the WVSU campus bolsters us with additional personnel, facilities, and support. Through the USDA, they continue to fund four Graduate Research Assistantships per semester. In 2014, the BT Program became even more knitted together with "Land Grant." Our scope is extended through the (at least) 30 collaborators who are researchers at other institutions; see Exhibit Y, collaborators beyond the WVSU Biotechnology Graduate Program. We have good graduate students who take ownership of their education and research. We are large enough to cover an impressive range of Biotechnology sub-disciplines, but small enough to interact with our students closely. Nobody gets lost in the crowd, we get to know our students, and we mentor individual development in every aspect of professional life.

2. During the period of this review, the BT Program has grown and matured. We have secured sufficient funding (some $9.5 million, see Exhibit D) to fill our existing research space with students and equipment. We're getting more and better applicants, particularly internationals. Our graduates succeed in the next step of their careers. We continue to work out minor policies and procedures, but most of the framework is in place (see Exhibit G, Graduate Student Manual). We doubled our graduation rate. During the previous five-year Program Review, 13 students earned MS degrees. In this five-year period, there were 27.

3. When we started the Biotechnology Graduate Program in 2002, we hoped that it would benefit the Biology undergraduate program. Although the fiscal impacts are hard to measure without more clear budgeting, we think that the graduate program has "upped the game" of the undergraduate program. The graduate program has attracted high-quality faculty, who then teach undergrads in classes and in their labs. The graduate program means graduate students, who bring their skills, diversity, and enthusiasm to Hamblin Hall. The work of graduate students is essential in the success of the program in publications and grants, which benefits undergraduates. In turn, stronger WVSU undergrads help the graduate program. One way is by providing some of our best-in-state graduate students.

4. One of the strengths of the BT program is the mentoring of our graduate students. We select applicants carefully (see Section II C, Entrance Standards and Abilities, above). In their first semester, we enroll them in "Seminar for Teaching Assistants" (BT 501), which gives a weekly forum for identifying students' problems of whatever nature, monitoring and helping their teaching, getting feedback, and generally getting to know one

another. We formally evaluate GTA's teaching, for their good as well as that of their students. The Program Coordinator keeps a spreadsheet of each student's progress through the timeline of the program and takes an active part in keeping things on track. Individual program faculty and staff take a personal interest in ensuring that no student lacks housing, financial support, academic help, etc. By doing this, we hope nobody falls through the cracks.

Weaknesses

1. For a portion of the review period, we lacked a budget, and the costs and funding of the BT Program were not clear. Currently, The BT Program is largely funded from three sources: 1) The U.S. Department of Education's HBCU Master's Program; 2) the USDA National Institute for Food and Agriculture (NIFA); and 3) the National Science Foundation's West Virginia Experimental Program to Stimulate Competitive Research (EPSCoR). The largest source of funding to support the BT Program cones from HBCU Masters in the sum of $464,500. USDA-NIFA and WV EPSCoR annually funds the BT Program at the levels of $48,000 and $36,000, respectively. That is more than a half million dollars invested in one graduate programs, all from federal resources. Additionally, all of these sources are funded from a 5-year cycle and have become more consistent than even state funding.

To address the weakness and concern regarding the budgets, the Provost and Vice President for Academic Affairs will ensure that budgets from these three aforementioned BT Program funding sources are shared with the director of the BT Program.

2. We could use some staff support along the lines of the "Assistant to the Dean" position to do a slate of important tasks: public school outreach, recruiting in the state and region, alumni relations, and the running the BT web site (and other media). Faculty and staff are already stretched thin, and it simply takes personnel time to complete these tasks. This position would also be key in program assessment, both in the initial set-up phase and in on-going management.

The Provost and the Director of Title III Programs at WVSU are in the process of working with the BT Program to develop a staff support position to address many of the aforementioned needs of the Master's program. While funding continues to decrease, there appears to be an opportunity to use federal Title III funds and HBCU Masters funding to support a position along the line of an Assistant to Dean.

3. We could use better library access to journals in specialized sub-disciplines of Biology. Although it doesn't necessarily prevent students from getting access to recent papers, they mostly do it by using other people's library accounts at other universities.

The University has recently received approval from the US Department of Education, via the WVSU Title III Program to increase investment in library holdings and databases, especially in the areas of STEM. The goal is to increase the funding level by 10 percent annually over the next 5 year funding period.

4. Faculty are now getting a better understanding of what "program assessment" is and how to do it. To that fact, the University has developed a comprehensive, university-wide assessment plan and is in the process of establishing a consistent approach for collecting and analyzing assessment data. The culture of assessment needs to continue to expand to obtain visibility and support from all internal and external constituents. A centralized electronic repository for all assessment data collected will be defined.

Section III: Viability

A. Program Enrollment

Because the MA degree is coursework-only, MA students do not need the lab space that MS students need for their thesis work. Therefore, the BT Program could easily enroll many more MA students without additional cost or facilities. In practice, there are no more than two MA students each semester (the most ever was two MA students in Fall 2010 and Spring 2011), and some do not even enter the MA track until completing several

semesters in the MS track. The MA option only makes sense as an appendage to the MS portion of the BT Program.

When the BT Program was designed in 2001-2002, we thought that the MA degree might be attractive to regional secondary education science teachers who wanted to meet post-BS accreditation requirements with a non-research degree. This has yet to happen; however, it may with advertising and better established relationships with the public schools.

B. Course Enrollment

For the numbers, see Appendix III-B.

Course enrollment necessarily tracks with program enrollment. Note that graduate students tend not to enroll in summer courses, mainly because tuition is not covered in the summer. Students only enroll in the summer if they intend to graduate in August (they must be enrolled in the semester they graduate).

We expect enrollment to be low in the courses Graduate Research (BT 590), Graduate Independent Study, or Research (BT 591) and Graduate Library Research (BT 592). These courses are for independent study (one-on-one with faculty), and are not counted in BT faculty teaching loads. They are offered to give students maximum flexibility in their schedules and in learning special topics.

Most graduate elective courses are paired with an undergraduate offering. Populating the course with both undergraduates and graduates helps us justify offering the course at all. Of course, more and more rigorous performance is required, and expectations are greater for graduate students than undergraduates.

C. Enrollment Projections

Considering MA enrollment only, we project enrollment to stay below two students per semester. We could enroll an additional ten with no additional accommodations, but that is unlikely to happen given the current structure.

D. Cost Analyses

A cost analysis is performed for the Program Review to provide data about the Departmental Cost of Instruction and the Facilities and Administrative Costs, which are not instructional driven, but attribute the overall educational experience of students.

Departmental Cost of Instruction:
The Departmental Cost of Instruction encompasses two components: 1. Departmental cost to offer the major; and 2. Departmental cost to offer courses in the department. To determine the departmental cost to offer the major, calculations are conducted to generate the program cost per graduate and the cost per student in the major. It should be noted that in this cost analysis we only considered the salaries including fringe benefits.

Calculation of the cost to offer the major: The numerator value is determined by using 2014-2015 faculty salary data for full-time and part-time faculty (including fringe benefits) who provide instruction for courses offered in the major (degree program). The value excludes salary compensation for instruction in general education courses (services courses) unless those courses are required for the major and serves as the numerator value for both the *program cost per graduate* and the *cost per student in the major* formulas.

Two denominator values are determined for the various calculations. For the program *cost per graduate* calculation, the denominator value is the average number of program graduates for the 2010-2014 period, while the *cost per student in the major* calculation uses the average number of majors in the degree program during the same review period as the denominator value.

The resulting formulas are:

Cost per graduate = $\frac{\text{2014-2015 degree program instructional faculty}}{\text{Average number of program graduates 2010-2014}}$

Cost per student in the major = $\frac{\text{2014-2015 degree program instructional faculty}}{\text{Average number of majors in the degree program 2010-2014}}$

Biotechnology program cost per graduate = $161,606/5.8 ~ $27,863
Biotechnology program cost per student in the major = $161,606/37.8 ~ $4275
Calculation for the departmental cost to offer courses in the department: The previously generated numerator value also serves as the numerator for this calculation. The denominator of this calculation is student credit hours produced for the academic years (2010-2014) of the five year review period. The credit hours produced is calculated using courses taken by both majors and non-majors.

The resulting formula is:
Cost of courses offered in the department =

$\frac{\text{2014-2015 degree program instructional faculty}}{\text{Total student credit hours produced by department}}$

Biotechnology Program cost per credit hour offered in the department
= $161,606/272 ~ $594

The Facilities and Administrative cost also using total faculty compensation for 2014-2015 as the numerator. For this value, the denominator federal indirect rate of 56.9%, which is a measure that is used to determine the cost of operation for grant administration.

The formula Facilities and Administrative cost (Non-instructional operational cost):

Facilities and Administrative cost = $\frac{\text{2014-2015 degree program instructional faculty}}{}$ * 0.569

Biotechnology Facilities and Administrative cost = $161,606 * 0.569 ~ $91,954

The ratios are exhibited in the table below.
Total Salary: $161,606

	Avg Majors (AY10-AY14)	Avg Graduates (AY10-AY14)	CPCH (AY 10-AY14)	Cost of Operation (AY 2014)
Average per year	37.8	5.8	272	0.569
Cost Ratios	$4275	$27,863	$594	$91,954

In summary, the total salary for faculty during the 2014-2015 year of the review period is $161,606 and includes both part-time and full-time faculty salaries. The average cost per major is $4275 while the average cost per graduate is $27,863. Both values include all unduplicated student majors and graduates for the 5-year review period. The cost of offering courses in the department for all students is based on the total semester credit hours (fall and spring combined) generated is $272 credit hours per year. The cost of operation (non-instructional cost) is $91,954.

E. Service Courses

N/A

F. Off-campus Courses

N/A

G. Articulation Agreements

N/A

Section IV: Necessity

A. Similar Programs

The closest similar program is the program at Marshall University just over 50 miles away. Rather than specializing in Biotechnology, their graduate programs in the Life Sciences are in Biomedical & Biomolecular Science, Ecology & Evolution, Watershed Management, Environmental Sciences, and Forensic Science. But even if our programs had to be compared head-to-head, corrected for program size and faculty teaching loads, our program is competitive with Marshall, or any school nationwide.

Graduates from the BT Program do not feed into any particular job. If there were such an employer in the region, we would certainly find a way to provide well-trained employees. Therefore we define "Biotechnology" broadly and prepare our students to be flexible as the field evolves. As such, we are pleased to note that our graduates from the review period have entered a variety of Biotechnology jobs.

B. Job Placement

Of the two students who graduated from the BT Program with MA degrees during this review period, neither is employed in a job in her field at this time. But note that both (and perhaps the third, who left the program early for the expressed purpose of entering professional school) are successfully moving through their chosen career educational tracks, toward a job. As stated above, this is what students want the MA degree for in the first place.

Appendices

Appendix II-A curriculum Biotechnology Graduate Program MA degree and areas of concentration and courses that comprise each

Organismal / Environmental

Biol 510	Conservation Ecology	3 credits
Biol 521	Animal Parasitism	4
Biol 550	Evolution	3
Biol 565	Biology of Fishes	4
Biol 575	Principles of Aquaculture	4
Biol 605	Advanced Ecology	4
Biol 635	Animal Physiology	4
Biol 660	Environmental Microbiology	4
Biol 671	Advanced Environmental Microbiology	2
BT 501	Seminar for Teaching Assistants	1
BT 590	Graduate Research	1-4
BT 591	Graduate Independent Study or Research	1-4
BT 592	Graduate Library Research	2
BT 598	Industry Internship in Biotechnology	1-3
BT 599	Special Topics in Biotechnology	1-4
BT 695	Master's Thesis Research	1-9
Chem 512	Environmental Chemistry	3

Molecular / Microbial

Biol 550	Evolution	3 credits
Biol 561	Microbial Genetics	4
Biol 660	Environmental Microbiology	4
Biol 666	Cancer Biology	3
Biol 671	Advanced Environmental Microbiology	2
BT 501	Seminar for Teaching Assistants	1
BT 590	Graduate Research	1-4
BT 591	Graduate Independent Study or Research	1-4
BT 592	Graduate Library Research	2
BT 598	Industry Internship in Biotechnology	1-3
BT 599	Special Topics in Biotechnology	1-4
BT 695	Master's Thesis Research	1-9
Chem 512	Environmental Chemistry	3
Chem 525	Advanced Organic Chemistry	3
Chem 531	Biochemistry	3
Chem 533	Biochemistry Laboratory	2

Any course that a student's Master's Thesis Committee, in that student's Plan of Study, designates as a satisfactory elective course may be counted as an elective.

Appendix II-B: Faculty

These faculty taught in the Biotechnology Graduate Program from Fall 2012 through Spring 2014.

Dr. Kevin Barry

Dr. J. Mark Chatfield

Dr. Sean Collins

Dr. Jonathan Eya

Dr. Richard Ford

Dr. Micheal Fultz

Dr. Gerald Hankins

Dr. Robert Harris

Dr. David Huber

Dr. Umesh Reddy

Dr. Tim Ruhnke

Faculty Data Sheet

Name: Dr. Kevin Barry	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Maryland	**Data Degree Received: 2012**
Area of Specialization: plant ecology, invasive species	

Professional Registration/Licensure:
Years of employment at present institution: 3
Years of employment in higher education: 3
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 101, Principles of Biology	95
Spring 2013	Biol 101, Principles of Biology	48
	Biol 310/510, Conservation Ecology	7
	NSM 101, Freshman Experience	12
Fall 2013	Biol 101, Principles of Biology	105
	Biol 101H, Principles of Biology (honors)	2
Spring 2014	Biol 101, Principles of Biology	48
	Biol 250, Ecology	11

(B) If degree is not in area of current assignment, explain:

(C) Identify your professional development activities during the past five years.

I attended the Ecological Research as Education Network (EREN) meeting this summer, where I became involved in several research projects designed to involve undergraduates in large-scale ecological research. EREN is an NSF-funded organization of faculty at small universities whose goal is to integrate undergraduate education and long-term ecological research.

I am a member of the Ecological Society of America (ESA), the Botanical Society of America (BSA), and the American Association for the Advancement of Science (AAAS)

I am working with Drs. Reddy, Huber, and Haas on a recently awarded $260,000 grant to study the genomics of adaptation to mine soils.

Thus far we have visited our field sites, have developed a sampling plan, and are working on further developing certain aspects of both the observational and manipulative parts of the research before beginning sampling and planting in the field.

My research student Jordan Dillon received a $2500 NASA Space Grant Scholarship for the project “Secondary metabolite production in Ailanthus altissima under varying light levels”. The proposal is attached below.

In the summer and fall of 2013 I mentored Jordan Dillon during his work on the NASA funded project “Secondary metabolite production in Ailanthus altissima under varying light levels”. The research involved locating and sampling A. altissima leaves, creation of leaf extracts in the lab, and testing of various leaf extracts on radish seed germination. Data analysis for this project is till underway, and Jordan has begun work on a PowerPoint presentation at an upcoming Honors Program meeting.
I also mentor Vasilios Dianellos on his AmeriCorps project.

Native Plant Garden – The Hamblin Hall Native Plant Garden was installed on Earth Day in April 2013 with the help of several undergraduate students, staff, and faculty. During the planting of the garden, I was interviewed by local news and the Daily Mail. The garden currently contains 12 different native species, and was enhanced and maintained with the help of undergraduate Jordan Dillon in summer 2013. To educate students and visitors about the garden and native species, I maintain a weekly updated chalkboard that I place outside of Hamblin Hall to highlight which species are in bloom, and interesting facts about the species. Since all garden species are perennial, the garden will become more lush and full this upcoming Spring and Summer. The garden proposal is attached below.

Ecological Research as Education Network (EREN) – I am planning a long-term study on forest dynamics as part of a multi-site EREN project. This study, which involves monitoring tree growth and changes in forest structure, will be conducted at Kanawha State Forest. Additionally, I will use these sites for research on leaf decomposition and invasive species, also as part of EREN. This leaf decomposition project would involve placing the leaves of Ailanthus altissimia and a native species in mesh bags and monitoring their mass over time. Plots will also be monitored for the invasive insect emerald ash borer, and the presence and identity of invasive earthworms may also be monitored. This research and variations on these projects will be largely driven by undergraduates.

Tree Campus USA – I serve as on the Tree Advisory Board for WVSU’s Tree Campus USA initiative.

Hamblin Hall greenhouse – I measured the Hamblin Hall greenhouse and drew up a schematic plan for installation of Dr. Nimmakayala’s extra growth lights. Work began on this project, with several struts already installed to support lights, but other projects have unfortunately drawn away the attention of Physical Facilities. Once the lights are installed it will improve greenhouse yields, especially during the winter, and make the space more effective as a teaching greenhouse.

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

(E) Indicate any other activities that have contributed to effective teaching.

(F) List professional books/papers published during the last five years.

(G) List externally funded research (grants and contracts) during the last five years.

Faculty Data Sheet

Name: Dr. Mark Chatfield	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Oregon State University	**Data Degree Received:**
Area of Specialization: plant physiology, genetics, biochemistry	

Professional Registration/Licensure:
Years of employment at present institution: 23
Years of employment in higher education: 31
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 120, Fundamentals of Biology	61
	Biol 121, Biological Diversity	15
	Biol 444/644, Plant Physiology	6
	Biol 490, Directed Student Research	2
Spring 2013	Biol 110, Economic Biology	10
	Biol 490, Directed Student Research	1
	Chem 331/531, Biochemistry	24
	Chem 333/533, Biochemistry lab	8
Fall 2013	Biol 108, Environmental Biology	30
	Biol 440/640, Field Botany	4
	Biol 490, Directed Student Research	3
Spring 2014	Biol 121, Biological Diversity	52
	Chem 331/531, Biochemistry	21

(B). If degree is not in area of current assignment, explain: [degree is in area of assignment]

(C). Identify your professional development activities during the past five years.

Toured World Food Program in Nairobi Kenya, July 2013 During the Summer break I participated by leading tours of several World Food Program Centers in Nairobi Kenya with Padma Nimmakayala and several WVSU undergraduate and graduate students. We were in Kenya for 2 weeks.

I am a Co-PI on a CBG for this travel but I can't remember what year it was awarded 2012 maybe?

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Invited lecturer in Biochemistry at Universidad Autonoma de Coahuila in Torreon Mexico November 2012

(E). Indicate any other activities that have contributed to effective teaching.

Trained in Quality Matters Online teaching Courses at WVSU 2012-2013

(F). List professional books/papers published during the last five years. [none since 2007]

(G). List externally funded research (grants and contracts) during the last five years.

a. Successful grant application to non-WVSC source – Yes CBG Online Learning for $499,000
b. Unsuccessful grant application to non-WVSC source: - Yes CBG Peppers for $499,000.

Faculty Data Sheet

Name: Dr. Sean Collins	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Illinois	**Data Degree Received: 2003**
Area of Specialization: entomology, ecology	

Professional Registration/Licensure:
Years of employment at present institution: 8
Years of employment in higher education: 8
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 250, Ecology	16
	Biol 320/599, Entomology	5
	Biol 411/BT511, Senior Seminar/Biotech Seminar	19
Spring 2013	Biol 121, Biological Diversity	18
	Biol 250, Ecology	25
	Biol 399, Herpetology	13
	Biol 121, Biological Diversity	52, team-taught
	Biol 326, Vertebrate Zoology	12

(B) If degree is not in area of current assignment, explain:

My Ph.D. from the University of Illinois is in Entomology

(C) Identify your professional development activities during the past five years.

Served as WVSU's representative to the Advisory Council of Faculty (2010 - 2011)

WebCT workshops (2009 - 2010)

NSF Bioinformatics workshop in Little Rock, AR (2013)

Served on 2 grant review panels for the National Institutes for Food and Agriculture (USDA) for years 2013 and 2014.

I assisted with aspects of the planning for the West Virginia Academy of Sciences research symposium held on

campus, as well as moderated a session of oral presentations and served as a judge for the poster competition (2012).

I was a member of a group from WVSU that was invited to Elizabeth City State University (NC) to discuss a planned grant proposal to the National Science Foundation.

North Central Self-Study Criterion Committee (Criterion 2 [integrity], Core components C & D)

Served on the Biology department subcommittee for establishing the guidelines for the rubrics, courses, and assignments to be used for accreditation using LiveText

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

(E) Indicate any other activities that have contributed to effective teaching.

I have served as the content specialist for the following Education students over the last 5 years:
Howard Mize, Brian Lanham, Danielle Perry, Allison Belcher, Ann Lucas, Ronald Smith, Desiree Unselt, Elisha Westfall, Lorrie Mottesheard and Pamela Darnold

(F) List professional books/papers published during the last five years.

Size variation in cicada killer wasps (*Sphecius speciosus*) from urban and rural nesting aggregations. (presented by Hunter Aliff)- Abstract

Genetic variation in cicada killer wasps (*Sphecius speciosus*) from urban and rural nesting aggregations. (presented by Belinda Fox)- Abstract

Size variation in cicada killer wasps from urban and rural nesting aggregations. (Poster presentation by Hunter Aliff and Michael McClain)- Abstract

(G) List externally funded research (grants and contracts) during the last five years.

Association of gene expression profiles of oxidative phosphorylation and nutrient efficiency, growth and development in different life stages of rainbow trout, *Oncorhynchus mykiss.* NSF Capacity Building Grant; Co-PI with Dr. Jonathan Eya (2012)

Faculty Data Sheet

Name: Dr. Jonathan Eya	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Auburn University	**Data Degree Received: 1997**
Area of Specialization: fisheries science, aquaculture	

Professional Registration/Licensure:
Years of employment at present institution: 15
Years of employment in higher education: 21
Years of related experience outside higher education: 3

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2012	Biol 101, Principles of Biology	48
Fall 2012	Biol 101, Principles of Biology	48
	BT 567, Current Concepts in Biotechnology	10, team-taught
Spring 2013	Biol 101, Principles of Biology	48
Fall 2013	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 101, Principles of Biology	48

(B). If degree is not in area of current assignment, explain: NA

(C). Identify your professional development activities during the past five years.

Organized a collaborators meeting five scientists from Mississippi State University, USDA-ARS Catfish Genetics Research Center and USDA-ARS National Center for Cool and Coldwater Aquaculture to evaluate the progress of the USDA funded research in July 2009

Presented “Genetic relationships of growth, feed efficiency and mitochondrial function in rainbow trout fed diets differing in dietary lipid levels” and “Effects of strain and diet on growth performance characteristics and relative expression of genes coding for electron transport chain in channel catfish "and “Aspects of mitochondrial function, growth and nutrient efficiency of rainbow trout fed diets containing different levels of dietary fat” Aquaculture America 2012, Las Vegas, Nevada. February 20 – March 2, 2012.

Presented “Relationship and genetic variation to mitochondrial function in growth performance and feed efficiency of juvenile rainbow trout, Oncorhynchus mykiss.” and “Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish, Ictalurus

punctatus)." The Annual International Conference and Exposition of the World Aquaculture Society. Natal Convention Center, Natal/RN Brazil. June 6-10, 2011.

Presented "Mitochondrial Function and Growth in Channel Catfish: Strain and Diets Effects." and "A possible association of mitochondrial function with feed efficiency in rainbow trout Oncorhynchus mykiss: diets and full-sib family effects" 1890 institutions of Association of Research Directors 16th Biennial Research Symposium at Atlanta, Georgia, April 9- 13, 2011.

Was a collaborator in a grant involving 1890 institutions, 1862 institutions and Federal Government agencies and the proposal was submitted to USDA-NIFA and the proposal was not funded.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Participated in the USDA-CSREES/CP Small Business Innovation Research Peer Review System (December 2009).

Participated in the National Oceanic and Atmospheric Administration (NOAA) Research Peer Review System (December 2010).

(E). Indicate any other activities that have contributed to effective teaching.

Attendance of conferences (national and international) and acquiring knowledge of the latest development in my area of expertise as well as other areas and utilizing the knowledge gained in my teaching.

(F). List professional books/papers published during the last five years.

Eya, J.C. Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2014. Effects of dietary lipid levels on mitochondrial gene expression in low and high-feed efficient families of rainbow trout (Oncorhynchus mykiss). Journal of Fish Biology 84: 1708-1720.

Eya, J.C. Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2013. Effects of dietary lipid levels on growth, feed utilization and mitochondrial function in low- and high- feed efficient families of rainbow trout (Oncorhynchus mykiss). Aquaculture 416-417: 119-128.

Eya, J.C., Ashame, M.F. Pomeroy, C.F., Manning, B.B. and Brian, B.C. 2012. Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish (Ictalurus punctatus). Comparative Biochemistry and Physiology Part B 163: 211-220.

Eya, J.C., Ashame, M.F. and Pomeroy, C.F. 2011: Association of mitochondrial function with feed efficiency in rainbow trout: Diets and family effects. Aquaculture 321(1-2):71-84.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Influence of diet on mitochondrial complex activity in channel catfish, Ictalurus punctatus. North American Journal of Aquaculture 72: 225-236.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Nutritive evaluation of protein from anaerobically digested poultry wastes as a dietary ingredient replacer for channel catfish, Ictalurus punctatus. Journal of World Aquaculture Society 41(S2):179-190.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Researchers study effect of diet and strain on catfish production. Aquaculture North America, July/August, page 7.

(G). List externally funded research (grants and contracts) during the last five years.

DOD - Research and Education Program Grant No. W911NF-14-1-0122 ($156,336), P1.

USDA – Capacity Building Grant No. 2011-38821-31130 ($295,663), PI.

Faculty Data Sheet

Name: Dr. Richard Ford	**Rank: Associate Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Miami University (OH)	**Data Degree Received: 1993**
Area of Specialization: micro/molecular genetics	

Professional Registration/Licensure:
Years of employment at present institution: 13
Years of employment in higher education: 15
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 210, Basic Anatomy and Physiology	29
	NSM 101, Freshman Experience	9
	BT 501, Seminar for Teaching Assistants	6
Spring 2013	Biol 101, Principles of Biology	21
	Biol 345/599, General Virology	7
	BT 510, Seminar for Teaching Assistants	4
Fall 2013	Biol 120, Fundamentals of Biology	90
	BT 501, Seminar for Teaching Assistants	4
Spring 2014	Biol 101, Principles of Biology	45
	NSM 101, Freshman Experience	20
	BT 501, Seminar for Teaching Assistants	3

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Since Fall 2009, I did my last two years as Biology Department Chair / Biotechnology Graduate Program Director (Fall 2009 - Spring 2012). I resumed the job of Biotech Coordinator (Fall 2013 - present). I have been the WVSU Faculty Representative to HEPC's Advisory Council of Faculty (Fall 2011 - present). I developed and taught new courses at dual undergraduate/graduate levels: Immunology (Spring 2012) and General Virology (Spring 2013), and one new graduate level course: Seminar for Teaching Assistants (Fall 2012). I became Editor for the Proceedings of the West Virginia Academy of Science (Spring 2012 - present), served on the WVAS Executive Committee (Spring 2012 - present), and hosted the combined WVAS / STaR Symposium meetings at WVSU (April 20-21, 2012). I have served on many departmental and campus-wide committees, served on at least three search committees. I have been on at least three Master's Thesis Committees.

My professional development has been the product of learning and doing these jobs.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

(G). List externally funded research (grants and contracts) during the last five years.

Faculty Data Sheet

Name: Dr. Micheal Fultz	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Indiana University	**Data Degree Received: 2009**
Area of Specialization: organic chemistry	

Professional Registration/Licensure:
Years of employment at present institution: 6
Years of employment in higher education: 6
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2014	BT 599, Specrtoscopic Methods	1

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

I have been a member of the local American Chemical Society Section for the last 5 years serving on the executive committee for the last four. I also serve as the faculty adviser for the student group on campus. Over the last four years I have taken students to 4 national meeting where they presented 13 presentations in research and teaching.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

2013 West Virginia State University FACET Outstanding Teacher Award

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Fultz, Micheal, W.; Rollyson, William, Pyrazines and Quinoxalines. In Heterocyclic Chemistry in Drug Discovery; Li, J. J. Ed. Wiley and Sons: New York, 2013, Chapter 10.

Fultz, Micheal, W. Borshe-Drechsel cyclization. In Name Reactions in Heterocyclic Chemistry II; Li, J. J., Ed. Wiley and Sons: New York, 2011, Chapter 3.2, pp 91-101.

Williams, D. R.; Fultz, M.W.; Christos, T. E.; Carter, J. S. A general preparation of (Z)-1-fluorostilbene derivatives for the design of conformationally restricted peptidomimetics, Tet. Lett. 2010, 51, 121-124.

(G). List externally funded research (grants and contracts) during the last five years.

Department of Defense “Acquisition of HPLC-Mass Spectrometer” – West Virginia State University” Micheal Fultz (PI), 2013, $324,893

West Virginia Research Trust Fund “Acquisition of Gas Chromatograph” – West Virginia State University” Micheal Fultz (PI), 2013, $20,000

West Virginia Idea network for Biomedical Research “Chiral sulfonation and synthesis of gliotoxin isomers with anticancer properties” Micheal Fultz (PI), 2013, $26,560

West Virginia Idea network for Biomedical Research “Synthesis of 6-deoxy-5a,6-didehydrogliotoxin (1) and bis(dethio)-10a-methylthio-3a-deoxy-3,3a-didehydrogliotoxin” Micheal Fultz (PI), 2012, $24,526

West Virginia Research Trust Fund “Acquisition of 400 MHz NMR – West Virginia State University” R. Charles Byers (PI), Micheal Fultz, Genia Sklute, Gerald Hankins, Ernest Sekabunga, Katherine Harper, 2011, $100,000

West Virginia Idea network for Biomedical Research “Acquisition of 400 MHz NMR – West Virginia State University” Micheal Fultz (PI), 2011 $30,000

National Science Foundation “West Virginia State University Planning Grant for STEM Program Evaluation and Improvement” R. Charles Byers (PI), Micheal Fultz, Sonya Armstrong, Thomas Guetzloff, Katherine Harper, 2011, $67,551

Faculty Data Sheet

Name: Dr. Gerald Hankins	**Rank: Associate Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Virginia	**Data Degree Received: 1991**
Area of Specialization: developmental genetics	

Professional Registration/Licensure:
Years of employment at present institution: 9
Years of employment in higher education: 23
Years of related experience outside higher education: 10

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2013	NSM 101, Freshman Experience	10
	BT 555, Biostatistics	11
	BT 572, Techniques in Biotechnology II	10, team-taught
Fall 2013	NSM 101, Freshman Experience	22
	BT 567, Current Concepts in Biotechnology	11, team-taught
	Biol 441/BT511, Senior Seminar/Biotechnology Seminar	19
	Biol 466/666, Cancer Biology	9
Spring 2014	NSM 101, Freshman Experience	15
	BT 555, Biostatistics	8
	BT 572, Techniques in Biotechnology II	8, team-taught

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Professional Affiliations: American Association for the Advancement of Science
American Council for Medicinally Active Plants
Genetics Society of America
West Virginia Academy of Science
Member, Cell Differentiation + Development Center, Marshall University

Presentations at:

NIH Biennial National IDeA Symposium of Biomedical Research Excellence (2010, 2012, 2014)
Gordon Research Conference on Fibroblast Growth Factors in Development & Disease (2014)
Genetics Society of America conference on Model Organisms to Human Biology: Cancer Genetics (2012)

Gordon Research Conference on Cancer Genetics & Epigenetics (2011)
Annual Conference of the American Council for Medicinally Active Plants (2010, 2011)
American Society for Biochemistry and Molecular Biology Special Symposium: Biochemistry And Cell Biology Of ESCRTs In Health And Disease (2010)
Annual Meeting, American Society of Pharmacognosy (2010)

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Nimmakayala P, Abburi VL, Abburi L, Alaparthi SB, Cantrell R, Park M, Choi D, Hankins G, Malkaram S, Reddy UK, Linkage disequilibrium and population structure analysis among Capsicum annuum L. cultivars for use in association mapping. Molecular Genetics and Genomics 289 (4): 513-521, 2014 [PMID: 24585251]

Reddy UK, Almeida A, Abburi VL, Alaparthi SB, Unselt D, Hankins GR, Park M, Choi D, Nimmakayala P, Identification of gene-specific polymorphisms and association with capsaicin pathway metabolites in Capsicum annuum L. collections. PLOS One 9: e86393, 2014 [PMID: 24475113]

Manohar S, Harlow M, Nguyen H, Li J, Hankins GR, Park M, Chromatin modifying protein 1A (Chmp1A) of the endosomal sorting complex required for transport (ESCRT)-III family activates ataxia-telangiectasia mutated (ATM) for PanC-1 cell growth inhibition. Cell Cycle 10 (15): 2529-2539, 2011 [PMID: 21705858]

(G). List externally funded research (grants and contracts) during the last five years.

Editor's note: Dr. Hankins submitted too much information to fit into two pages. He cited 12 externally-funded grants totaling over $1.3 million. Five examples are:

" Cytation 3 Cell Imaging Multi-mode reader and high-speed spectrophotometer", Equipment subaward from NIH grant 5P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence, $72,091.

“Alternative Utilization of Roselle Hibiscus as a Small Farm and Niche Market Crop”, Co-PI (PI: Dr. Kit Chin, SUBR Southern University) September 1 2012-August 31 2015, USDA/NIFA 2012-38821-20092, WVSU part: $50,000.

"Transdermal patch development of capsaicin using genomic approach for treatment of chronic low back pain", Mentor (P.I.: Gagan Kaushal, University of Charleston, Co-PI: Umesh Reddy, WVSU), Sept 1 2012-Aug. 31 2014, NSF RII subaward, $80,000.

“Development of value added peppers using genomic driven association mapping”, Sept. 1 2010-Aug. 31 2013, USDA/NIFA 2010-38821-21574, $299,810.

"Sex steroid hormones and epigenetics in meningiomas", May 1 2010-April 30 2014, WV-INBRE, NIH 5P20RR016477 & P20GM103434, $690,000.

Faculty Data Sheet

Name: Dr. Robert T. Harris	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Ohio University	**Data Degree Received: 1992**
Area of Specialization: biomedical science	

Professional Registration/Licensure:
Years of employment at present institution: 19
Years of employment in higher education: 21
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2013	Biol 331, Human Anatomy and Physiology I	24
	Biol 332, Human Anatomy and Physiology II	14
Fall 2013	Biol 331, Human Anatomy and Physiology I	19
	Biol 332, Human Anatomy and Physiology II	13
	Biol 370/599, Pharmacology	20
	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 331, Human Anatomy and Physiology I	21
	Biol 332, Human Anatomy and Physiology II	13

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

WVSC Outstanding Faculty Recognition; April 2010

1st Annual Conference of the American Council for Medicinally Active Plants Racine CR et.al. Anti-tumor properties and effects on vascular smooth muscle cell proliferation and migration of extracts of Hibiscus sabdariffa accessions. 1st Annual Conference of the American Council for Medicinally Active Plants, Rutgers University, New Brunswick, NJ, July 20-23, 2010.

51st Annual Meeting of the American Society of Pharmacognosy Racine CR et. al. In vitro screening of Hibiscus sabdariffa extracts for anti-tumor properties. 51st Annual Meeting, American Society of Pharmacognosy, St. Petersburg Beach, FL, July10-14, 2010.

WV IDEA Conference Harris, RT et al. Smooth Muscle Cells have an Inherent Capacity to Form Tube-Like Structures, WV IDEA Conference, Huntington, WV, March 23, 2010.

(E). Indicate any other activities that have contributed to effective teaching.

Hosted a Visiting Scientist for 3 months: Dawn Turner, Ph.D. Mountain State University

(F). List professional books/papers published during the last five years.

Kevin M. Rice, Sunil K. Kakarla, Sriram P. Mupparaju, Anhaiah Katta, Miaozon Wu, Robert T. Harris and Eric R. Blough . Shear stress activates Akt during vascular smooth muscle cell reorientation. Biotechnology and Applied Biochemistry 55: 85-90, 2010.

Rahul P. Nagmal, James R. Tchabo, Eric R. Blough, Robert T. Harris, Resveratrol attenuates fluprostenol induced hypertrophy of vascular smooth muscle cells. Biophysical Journal 98(3) Supplement 1: 4330, 2011.

Gary Hunter and Robert T. Harris. Structure and Function of the Muscular, Neuromuscular, Cardiovascular, and Respiratory Systems (chapter 1). In: Essentials of Strength Training and Conditioning. Third edition, Human Kinetics, (R. Earle, ed.) pp. 3-19. (2009)

K. M. Rice, S. Uddemarri, R. S. Kinnard, R. Harris, G.L. Wright, and E. R. Blough. Fluprostenol-induced ROS-dependent A7R5 smooth muscle cell hypertrophy involves the activation of mTOR, p70S6k, and PTEN. Prostaglandins Other Lipid Mediat. 85:49-57.

(G). List externally funded research (grants and contracts) during the last five years.

Effects of Muscle Loading and Unloading on microRNA Expression. Harris. NASA EPSCoR- MURC. $40,000.
Development of Value-Added Peppers Using Genomic Driven Association Mapping. Hankins, Harris, Reddy. USDA $299,937.

Influence of the HDAC inhibitor Trichostatin A on Hypertrophic and Atrophic Responses of Smooth and Skeletal Muscle. West Virginia Space Gant Consortium; Robert Harris, James Tchabo (graduate student), $12,000.

Mechanotransduction, Intracellular Signaling and Vascular Cell Biology, National Institute of Health, West Virginia INBRE program, $521,422, May 2009-April 2012. Robert T. Harris

Response of Vascular Smooth Muscle Cells to Stretch, National Institute of Health, West Virginia INBRE program, $1,140,000, June 2004-August 2009. Robert T. Harris

Research Support Program, West Virginia INBRE program, $190,000, June 2004-August 2009. Robert T. Harris

Faculty Data Sheet

Name: Dr. David Huber	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Michigan State University	**Data Degree Received: 1996**
Area of Specialization: microbial ecology, microbial genetics, plant pathology	

Professional Registration/Licensure:
Years of employment at present institution: 15
Years of employment in higher education: 15
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 341, Microbiology	16
	BT 567, Current Concepts in Biotechnology	5
Spring 2013	Biol 241, Introduction to Microbiology	10
	BT 572, Techniques in Biotechnology II	10, team-taught
Fall 2013	Biol 341, Microbiology	22
	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 241, Introduction to Microbiology	8
	Biol 361/561, Microbial Genetics	10
	BT 572, Techniques in Biotechnology II	8, team-taught

(B). If degree is not in area of current assignment, explain. Not relevant

(C). Identify your professional development activities during the past five years (Fall 2012 – Sp 2014).

Professional Meetings Attended

- American Society for Microbiology Annual Meeting, Denver, CO, May 2013; abstract and poster
- USDA Association of Research Directors Biannual Meeting, Jacksonville (FL), April 2013
- American Society for Microbiology Annual Meeting, Boston, MA, May 2014; abstract and poster
- 5 presentations at professional meetings in 2012; 7 presentations in 2013. (details available)

Host to Visiting International Research Collaborators

- Dr. Nagamani Balagurusamy (Universidad Autonoma de Coahuila, Mexico) visited my laboratory for a week in April. He also was a guest teacher in my new Microbial Systems Science (BIOL 599) class.

- Dr. Teodoro Espinosa-Solares (Universidad Autonoma Chapingo, Mexico). Espinosa visited my laboratory in order to collaborate on anaerobic digestion research.

Host to Visiting International Graduate Student Researchers: 3 from Mexico (details available)

(D). List awards/honors (including invitations to speak) None

(E). Indicate any other activities that have contributed to effective teaching.

- USDA CBG Research/Teaching Integration grant listed below. This grant was designed to also build teaching capacity: biotechnology resources at WVSU were increased through purchase of $100,000 Roche pyrosequencing instrument; new class was created (Microbial Systems Biology); workshop training was provided (Microbial Metagenomics Workshop)

- Agilent Gas Chromatograph ($40,000) was purchased for teaching and research through the NSF EPSCoR RII multi-institution grant (listed below)

- Upward Bound teaching to local elementary children (summer 2013)

(F). List professional books/papers published during the last five years.

Refereed Journal Publications

Shade, A., Peter, H., Allison, SD, Baho, DL, Berga, M., Burgmann H., Huber DH, Langenheder, S., Lennon, JT, Martiny JBH, Matulich KL, Schmidt TM, and Handelsman J. 2012. Fundamentals of microbial community resistance and resilience. Frontiers in Microbiology 3:417. (doi:10.3389/fmicb.2012.00417)

Sharma, D., Espinosa-Solares, T., Huber, DH. 2013. Thermophilic anaerobic co-digestion of poultry litter and thin stillage. Bioresource Technology. 136:251-256.

Smith, A.M., Sharma, D., Lappin-Scott, H., Burton, S., Huber, D.H. 2014. Microbial community structure of a pilot-scale thermophilic anaerobic digester treating poultry litter. Applied Microbiology and Biotechnology 98(5):2321-2334. (doi 10.1007/s00253-013-5144-y).

Rivera-Salvador, V., I.L. Lopez-Cruz, T. Espinosa-Solares, J.S. Aranda-Barradas, D.H. Huber, D. Sharma, J.U. Toledo. 2014. Application of Anaerobic Digestion Model No. 1 to describe the syntrophic acetate oxidation of poultry litter in thermophilic anaerobic digestion. Bioresource Technology 167:495-502.

Book chapter

Alvarado A, Nafarrate E, Huber D, Balagurusamy N (2012) Microbiología de la digestión anaerobia. In Balagurusamy N, Das KC (ed), Advances Tecnologicos en la Produccion de Biogas: Perspectives y Retos. Lap Lambert Academic Publishing, Saarbrücken, Germany.

(G). List externally funded research (grants and contracts) during the last five years.

Federal Grants as Principal Investigator (PI)

David Huber (PI), Ami Smith (Co-PI), Marek Krasnansky (Co-PI). USDA 1890 Research/Teaching Capacity Building Grant. Title: Implementing metagenomics-enabled systems analysis to engineer energy thresholds and resilience in microbial bioenergy communities. Amount: $564,000. Award dates: 9/2010-8/2014

Faculty Data Sheet

Name: Dr. Umesh Reddy	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Osmania University	**Data Degree Received: 1997**
Area of Specialization: genetics	

Professional Registration/Licensure: genetics, genomics and biotechnology
Years of employment at present institution: 10
Years of employment in higher education: 20
Years of related experience outside higher education: 1

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 411/BT 511, Senior Seminar/Biotech Seminar	20
Spring 2013	BT 572, Techniques in Biotechnology II	8
	Biol 270, Genetics	10
Fall 2013	Biol 411/BT 511, Senior Seminar/Biotech Seminar	25
	Biol 399/599, Crop Biodiversity and Genome	10

(B) If degree is not in area of current assignment, explain:

(C) Identify your professional development activities during the past five years.

1. Attended 25 national and international conferences
2. Federal grants funded up to two million dollars from USDA-NIFA
3. Supervised 12 graduate students for their thesis research
4. Served as member in 20thesis committees
5. Supervised 15 undergraduate student research
6. Published 25 research papers in peer reviewed journals
7. Organized high school student/teacher workshops in DNA techniques
8. Attended grant review panels
9. Reviewed 100 manuscripts for various journals
10. Served as chair for Research and Development committee
11. Supervised 5 postdoctoral research associates
12. Hosted 6 visiting scientists from India/Mexico

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

Five invited talks in Plant and Animal Genome Conference in San Diego in various genomic workshops

(E) Indicate any other activities that have contributed to effective teaching.

Developed laboratory modules for teaching various biotechnology techniques such as PCR, sequencing, genome analysis, mapping, cloning, genetic diversity, microarrays, alternative splicing, epigenetics, functional validation and qRT PCR for graduate and undergraduate students.

Obtained one million dollar funding from USDA-NIFA higher education proposals to strengthen facilities to teach biotechnology and genomics.

Editor's notes in italics. Dr. Reddy submitted too much material to fit into two pages, so I cut out the details. Dr. Reddy listed the four USDA-NIFA grants. I chose one example:

1. Stories of Crop Evolution, Biodiversity and Domestication and Methods of Genomic Assisted Crop Improvement for Curricula Development. (Contract/Grant/Agreement No: 2010-38821-21476 Proposal No: 2010-02247 Start: 01 Sep 2010 Term: 31 Aug 2013 Grant Yr: 2010 Grant Amount: $299,986)

(F) List professional books/papers published during the last five years.

Editor: Dr. Reddy listed 21 published papers on which he was an author. Two examples are:

1. Padma Nimmakayala, Amnon Levi, Lavanya Abburi, Venkata Lakshmi Abburi, Yan R. Tomason, Thangasamy Saminathan, Venkata Gopinath Vajja, Sridhar Malkaram, Rishi Reddy, Todd C. Wehner, and Umesh K. Reddy 2014. Single nucleotide polymorphisms generated by genotyping by sequencing used to characterize genome-wide diversity, linkage disequilibrium and selection sweep for worldwide cultivated watermelon. BMC Genomics 2014, 15:767 (Highly accessed)

2. REDDY UK, NIMMAKAYALA P, LEVI A, ABBURI VL, SAMINATHAN T, TOMASON YR, VAJJA G, REDDY R, ABBURI L, WEHNER TC, RONIN Y, KAROL A. 2014 High-Resolution Genetic Map for Understanding the Effect of Genome-Wide Recombination Rate on Nucleotide Diversity in Watermelon. G3: Genes|Genomes|Genetics. doi: 10.1534/g3.114.012815.

(G) List externally funded research (grants and contracts) during the last five years.

Editor: Dr. Reddy listed seven externally-funded grants (in addition to the four shown in section E, above. These total over $2.5 million. Four examples are:

1. Syntenic analysis of cucurbit cultivar complex for widening genetic diversity and functional genomics of fruit quality and architecture. Contract/grant/agreement no: 2007-38814-18472 proposal no: 2007-03466 start: 01 Sep 2007 term: 31 Aug 2011 Fy: 2009 grant yr: 2007, grant Amount: $499,762

2. Utilization of genomics for molecular breeding of high quality and disease resistant peppers contract/grant/agreement no: 2010-38814-13906 start: 01 Sep 2010, Grant Amount: $299,647

3. Genome-wide association mapping for improving nutraceutical traits in pumpkin and squash contract/grant/agreement no: 2012-38821-20277 proposal no: 2012-02508 start: 01 Sep 2012 term: 31 Aug 2015: Grant Yr: 2012, Grant Amount: $299,832

4. LD mapping of fruit traits in combination with transcriptomics of ploidy levels in watermelons to develop high yielding seedless cultivars. Accession no: 0223919 USDA-NIFA start: 01 Oct 2010 term: 30 Sep 2014 Fy: 2012; Grant Amount: $500,000

Faculty Data Sheet

Name: Dr. Tim Ruhnke	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Connecticut	**Data Degree Received: 1993**
Area of Specialization: zoology, parasitology	

Professional Registration/Licensure:
Years of employment at present institution: 19
Years of employment in higher education: 21
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 120, Fundamentals of Biology	48
	Biol 121, Biological Diversity	24
Spring 2013	Biol 120, Fundamentals of Biology	48
Fall 2013	Biol 121, Biological Diversity	12
Spring 2014	Biol 120, Fundamentals of Biology	30
	Biol 350/550, Evolution	4

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Campus Governance and Service

2010-present	Chair, Faculty Senate.
2012-present	Ex-officio member, WVSU Foundation Board.
2014	Member, Provost Search Committee.
2013	Member, Associate Provost Search Committee.
2013	Member, Shelter in Place Task Force.
2012	Member, Bioinformatics Research Associate Search
2012	Member, Admission Director Search Committee
2012-2013	Chair, Degree Completion Task Force.
2010-2013	Advisor, Beta Kappa Chi.

Manuscript Review

2014 Comparative Parasitology
2013 International Journal for Parasitology
2012 Folia Parasitologica and Comparative Parasitology
2011 Folia Parasitologica
2010 Vestnik Zoologii (Ukraine) and Comparative Parasitology
2009 Systematic Parasitology (2 manuscripts), Journal of Parasitology

D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Ruhnke, T.R. 2009. Systematics and Diversity of the Cestodes of Elasmobranch Fishes. Presented to the Department of Biology, West Virginia University.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Ruhnke, T. R. and R. E. Workman. 2013. Two new species and a new phyllobothriid cestode genus from sharks of the genus Negaprion Whitley (Carcharhiniformes). Systematic Parasitology 85: 37-48.

Ruhnke, T.R. 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.

Caira, J. N., M. Malek, and T. Ruhnke. 2010 A new genus of Phyllobothriidae (Cestoda: Tetraphyllidea) in carcharhiniform sharks from Iran and Australia. Journal of Helminthology.

Ruhnke, T. R. and H. D. Seaman. 2009. Three new species of Anthocephalum Linton, 1890 (Cestoda: Tetraphyllidea) from dasyatid stingrays of the Gulf of California. Systematic Parasitology 72: 81–95.

Ruhnke, T. R. and J. N. Caira. 2009. Two new species of Anthobothrium van Beneden, 1850 (Tetraphyllidea: Phyllobothriidae) from carcharhinid sharks, with a redescription of Anthobothrium laciniatum Linton, 1890. Systematic Parasitology 72: 217–227.

(G). List externally funded research (grants and contracts) during the last five years.

2010- present WVSU Faculty Coordinator, NSF EPSCoR RII, “Bionanotechnology for Public Security and Environmental Safety”.

2008-present Collaborator – NSF PBI: A survey of the tapeworms (Cestoda: Platyhelminthes) from the vertebrate bowels of the earth. NSF (J.N. Caira P.I.).

2009-present NASA Space Science Research Enhancement Award. Annual Award. Total amount awarded since 1999 approximately $25,000.

2006-2011 Collaborator – NSF BS&I: A Survey of the Elasmobranchs and their Metazoan Parasites of Indonesian Borneo (Kalimantan) (J.N. Caira, P.I.).

A**ppendix II-C: Assessment**

2009 BT Program Assessment Plan, MS Degree

The goal of the Graduate Program in Biotechnology is to develop subject matter knowledge, methodological expertise, communication skills, and critical thinking for students pursuing this degree. Additionally, the Program will provide a technically trained for workforce for the development of a more broadly-diversified workforce for the state of West Virginia and the region. The Master of Science in Biotechnology provides instruction in the diverse disciplines of Biotechnology, as well as specialized training in current concepts and technological advances. The Program prepares students for diverse careers in life science fields such as health care, agri-food, and environmental sciences. The program also includes in-field study for secondary bio-science education teachers.

All students graduating from the Program will take core courses and receive training in fundamental competencies such as molecular biology, environmental monitoring, digital microscopy and image data analysis, statistical analysis and bio-diagnostics. In addition, special competencies may be gained in such areas as chemical and biological environmental technology, waste stream and resource management, aquaculture, modern horticultural techniques, and advanced knowledge and expertise in the biology of plants, animals or microbes.

Methods and Measures of Assessment:

The assessment methods used to ensure a quality graduate education for students and to determine overall achievement of the program's educational objectives include the following elements:

- Subject matter knowledge in key areas: Measurement of this outcome includes students' grades in Biotechnology core courses and thesis advisory committee evaluations of performance in (MS) research defense examinations or the comprehensive exam for MA candidates.

- Methodological expertise in the particular areas of research: Measurement of this outcome includes students' grades in Biotechniques I and II, and Biostatistics. In addition, MS student thesis committee members evaluate methodological expertise at the time of thesis proposal and thesis defense. MA student candidates' methodological expertise is evaluated via the comprehensive exam.

- Communication skills: All graduate students are required to make two seminar presentations in the department's seminar series. The faculty member in charge of the seminar series evaluates the student's presentation. In addition, all Master's degree candidates are required to serve as a teaching assistant for at least two courses. The professor of record for the course evaluates the students' performance. Master of Science candidates' writing skills are assessed both at the thesis proposal stage, the thesis writing plan, and the final thesis. Master of Arts candidates' writing skills are assessed at the comprehensive exam, which is compared to written performance in courses taken.

- Professional development and critical thinking: Measurement of this outcome includes papers published, abstracts submitted, presentations at scientific meetings, performance in industry internships, and the successful defense of the master's thesis. Industry supervisors will provide a written evaluation of students' communication skills, methodological expertise and subject matter knowledge. Alumni surveys will gauge effectiveness of the program in fostering further student development.

Other Assessment Measures in Place:

- Graduate Student Checklist and progress charts: The Director of the Biotechnology Graduate Program periodically (at least once a semester) measures student progress by evaluating plan of study, selection of thesis advisor and/or committee, submission of research proposal, etc. The Director writes letters to the candidates and Thesis Research Advisors regarding student progress. The Director, as advisor for all MA students, communicates with these students directly.

- Faculty Evaluations: Semester course evaluations provide student feedback regarding teaching effectiveness of Faculty and Graduate Teaching Assistants.

Other Assessment Measures in Progress:

- Exit Interviews: Graduate students will be required to participate in an exit interview with the Director shortly before leaving the institution.

- Alumni Surveys: Annual surveys of alumni will be undertaken to gauge the relevance of their educational experience in the Program. These surveys will ask for specific recommendations on changes that should occur to improve the program.

- Employer Surveys: Annual surveys of program graduates' employers will be conducted to gauge the level of satisfaction employers experience from the Biotechnology Graduate Program. Questions relate to current satisfaction as well as desired characteristics of future graduates.

Additional assessment methods and measures include periodic Thesis Committee meetings to appraise student research progress.

Use of Data to Drive Program Decisions

The Director is responsible for compilation of data at the beginning of each academic year and will prepare an annual assessment report. The Biotechnology Graduate Faculty will review the report and make recommendations for action (which may include curriculum or student outcomes revisions) to the director, who will initiate action for improvement.

August 20, 2009

Academic Affairs Assessment of Student Learning Report for Academic Year *2013-2014*
Department/Program Biotechnology MS

Program Learning Outcomes Developed in AY 2010-2011

1. Scientific Method: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.
2. Laboratory Skills: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.
3. Content: Demonstrate an understanding and proficiency in one of the specialized areas of study: Organismal/Environmental or Molecular/Microbial.
4. Scientific Issues: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.
5. Communication Skills: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. Which learning outcomes did you measure this past year? [Please indicate whether any of these measures were conducted as follow-up to a previous year's issues or in response to Program Review. Be specific.]
The previously developed PLOs for the Biotechnology graduate program were never utilized. Five types of assessment were identified in three courses. Three of the assessment types were based on final grades in the courses. The other two assessments were to evaluate written and/or oral communications of an assignment or the MS thesis. While rubrics were developed for these two assessments, who would undertake this component was not determined.

2. In which course(s) were assessments conducted?
None during academic year 2013-2014.

3. How did you assess the learning outcomes(s)? (i.e., method and tool, e.g., rubrics, national norms, item analysis, sampling, student projects, presentations, exams, etc.)
None during academic year 2013-2014.

4. Who analyzed results and how were they analyzed? (Committee, assessment liaison, department faculty, statistical review vs. benchmark, Live Text, etc.)
None during academic year 2013-2014.

5. Summarize results/findings/conclusions. (Data analysis)
None during academic year 2013-2014.

6. What are next steps? (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)
With guidance from the university, the assessment team for the biotechnology program developed new PLOs in the fall of 2014. This plan was unanimously accepted by the graduate faculty in a motion made at a program meeting September 5, 2014. Plans are being made to create the necessary rubrics that will be presented to the graduate faculty at the next meeting (September 19). We plan to share the rubrics with our students to acquaint them with the faculty expectations of successful graduate students. This new plan will allow us to assess students both early and late in the program, to identify gaps in our program and to allow improvements, changes and additions to improve the program.

Appendix III-A: BT Program Enrollment Data, MA Degree

The following are the numbers of Biotechnology Graduate Students seeking MA degrees and numbers of MA graduates, by semester, Summer 2009 through Spring 2014.

semester	number of students	number of graduates
Summer 2009	0	0
Fall 2009	1	0
Spring 2010	1	0
Summer 2010	1	0
Fall 2010	2	0
Spring 2011	2	1
Summer 2011	0	0
Fall 2011	0	0
Spring 2012	1	1
Summer 2012	0	0
Fall 2012	0	0
Spring 2013	0	0
Summer 2013	0	0
Fall 2013	0	0
Spring 2014	0	0
total		**2**

Biotechnology Graduate Students do not enroll for classes in the summers, unless they intend to graduate in the summer, in which case they must be enrolled to graduate.

The Biotechnology Graduate Program also awarded two Graduate Certificates in Biotechnology in Spring 2014.

Appendix III-B: Course Enrollment Data

Appendix III-B contains combined data for MS (52 students) and MA (3 students). Data shown are course number, course title, and number of BT students enrolled.

Fall 2009

599	BIOL	SP TOP: MOLECULAR GENETICS	5
640	BIOL	FIELD BOTANY	1
666	BIOL	CANCER BIOLOGY	5
511	BT	BIOTECHNOLOGY SEMINAR	5
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	6
571	BT	TECHNIQUES IN BIOTECH I	6
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	6

Spring 2010

599	BIOL	ST: SEMINAR FOR TEACHING ASST	6
511	BT	BIOTECHNOLOGY SEMINAR	5
555	BT	BIOSTATISTICS	9
572	BT	TECHNIQUES IN BIOTECH II	7
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	7

Summer 2010

592	BT	GRADUATE LIBRARY RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	2

Fall 2010

599	BIOL	SP TOP: DEVELOPMENTAL BIOLOGY	6
599	BIOL	SP TOP: ENTOMOLOGY	1
599	BIOL	SP TOP: PLANT PHYSIOLOGY	5
599	BIOL	ST: EUCARYOTIC MOLECLR GENETCS	4
511	BT	BIOTECHNOLOGY SEMINAR	9
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	12
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
599	BT	ST: SEMINAR FOR TEACHING ASST	5
695	BT	MASTERS THESIS RESEARCH	5

Spring 2011

521	BIOL	ANIMAL PARASITISM	4
565	BIOL	BIOLOGY OF FISHES	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	5
660	BIOL	ENVIRONMENTAL MICROBIOLOGY	3
511	BT	BIOTECHNOLOGY SEMINAR	7

555	BT	BIOSTATISTICS	11
572	BT	TECHNIQUES IN BIOTECH II	9
590	BT	GRADUATE RESEARCH	2
599	BT	SP TOP: SEMINAR FOR TEACHING	3
695	BT	MASTERS THESIS RESEARCH	5

Summer 2011

695	BT	MASTERS THESIS RESEARCH	1

Fall 2011

599	BIOL	SP TOP: GENERAL VIROLOGY	1
640	BIOL	FIELD BOTANY	5
666	BIOL	CANCER BIOLOGY	6
501	BT	TEACHING SEMINAR FOR BIOTECH	5
511	BT	BIOTECHNOLOGY SEMINAR	15
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	10
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	10

Spring 2012

575	BIOL	PRINCIPLES OF AQUACULTURE	2
599	BIOL	SP TOP: IMMUNOLOGY	4
599	BIOL	SP TOP: MICRO SYSTEMS SCIENCE	5
599	BIOL	SP TOP: PHARMACOLOGY	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	3
511	BT	BIOTECHNOLOGY SEMINAR	6
555	BT	BIOSTATISTICS	7
572	BT	TECHNIQUES IN BIOTECH II	10
590	BT	GRADUATE RESEARCH	6
695	BT	MASTERS THESIS RESEARCH	12

Summer 2012

695	BT	MASTERS THESIS RESEARCH	1

Fall 2012

573	BIOL	EUKARYOTIC MOLECULAR GENETICS	8
599	BIOL	SP TOP: DEVELOPMENTAL BIOLOGY	7
599	BIOL	SP TOP: ENTOMOLOGY	1
644	BIOL	PLANT PHYSIOLOGY	2
501	BT	TEACHING SEMINAR FOR BIOTECH	6
511	BT	BIOTECHNOLOGY SEMINAR	7
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	5
571	BT	TECHNIQUES IN BIOTECH I	5
590	BT	GRADUATE RESEARCH	3

695	BT	MASTERS THESIS RESEARCH	11

Spring 2013

510	BIOL	CONSERVATION ECOLOGY	1
521	BIOL	ANIMAL PARASITISM	1
599	BIOL	SP TOP: GENERAL VIROLOGY	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	4
501	BT	TEACHING SEMINAR FOR BIOTECH	5
511	BT	BIOTECHNOLOGY SEMINAR	12
555	BT	BIOSTATISTICS	11
572	BT	TECHNIQUES IN BIOTECH II	10
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	8

Summer 2013

591	BT	GRADUATE INDEPENDENT STUDY	1
695	BT	MASTERS THESIS RESEARCH	1

Fall 2013

599	BIOL	SP TOP: PHARMACOLOGY	3
640	BIOL	FIELD BOTANY	1
666	BIOL	CANCER BIOLOGY	7
501	BT	TEACHING SEMINAR FOR BIOTECH	6
511	BT	BIOTECHNOLOGY SEMINAR	14
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	11
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	12

Spring 2014

550	BIOL	EVOLUTION	2
561	BIOL	MICROBIAL GENETICS	7
501	BT	TEACHING SEMINAR FOR BIOTECH	3
511	BT	BIOTECHNOLOGY SEMINAR	4
555	BT	BIOSTATISTICS	8
572	BT	TECHNIQUES IN BIOTECH II	8
590	BT	GRADUATE RESEARCH	3
599	BT	SP TOP: SPECTROSCOPIC METHODS	1
695	BT	MASTERS THESIS RESEARCH	12

Appendix III-C: Service Courses

The Biotechnology Graduate Program offered no service courses from Fall 2009 through Spring 2014.

Appendix III-D: Off-Campus Courses

The Biotechnology Graduate Program offered no off-campus courses from Fall 2009 through Spring 2014.

Exhibits

Exhibit A: Mission Statement, Biotechnology Graduate Program

January 24, 2010

The mission of the Biotechnology Program is to provide cross-disciplinary education and training in 21st century concepts and biotechniques to a diverse group of regional, national and international students. The program prepares a cadre of professionals for careers in the diverse industries being revolutionized by Biotechnology and prepares its graduates for advanced education. Through coursework, laboratory work and other academic experiences such as internships, students advance their critical thinking skills, and master the technical skills necessary to solve complex biological problems.

Exhibit B: Biotechnology Graduate Students, MA
Enrolled in the Program at any time from Summer 2009 through Spring 2014

January 17, 2015

advisor	dates	graduated?	now
Hankins	fall 10 - spring 12	yes	student in nursing program, Marshall Univ., WV
Ford	fall 09 - spring 11	yes	pharmacy school, NY
Ford	fall 10 - spring 11	no	status unknown

Exhibit C: Publications from the Biotechnology Graduate Program from Summer 2009 through Spring 2014

Jonathan Eya

1. **Eya, J.C.**, Ashame, M.F. and Pomeroy, C. 2010. Researchers study effect of diet and strain on catfish production. Aquaculture North America, July/August, page 7.
2. **Eya, J.C.**, Ashame, M.F. and Pomeroy, C. 2010. Nutritive evaluation of protein from anaerobically digested poultry wastes as a dietary ingredient replacer for channel catfish, *Ictalurus punctatus*. Journal of World Aquaculture Society 41(S2):179-190.
3. **Eya, J.C.,** Ashame, M.F. and Pomeroy, C. 2010. Influence of diet on mitochondrial complex activity in channel catfish*, Ictalurus punctatus*. North American Journal of Aquaculture 72: 225-236.
4. **Eya, J.C.,** Ashame, M.F. and Pomeroy, C.F. 2011: Association of mitochondrial function with feed efficiency in rainbow trout: Diets and family effects. Aquaculture 321(1-2):71-84.
5. **Eya, J.C.,** Ashame, M.F. Pomeroy, C.F., Manning, B.B. and Brian, B.C. 2012. Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish (*Ictalurus punctatus*). Comparative Biochemistry and Physiology Part B 163: 211-220.
6. **Eya, J.C.** Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2013. Effects of dietary lipid levels on growth, feed utilization and mitochondrial function in low- and high- feed efficient families of rainbow trout (*Oncorhynchus mykiss*). Aquaculture 416-417: 119-128.
7. **Eya, J.C.** Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2014. Effects of dietary lipid levels on mitochondrial gene expression in low and high-feed efficient families of rainbow trout (*Oncorhynchus mykiss*). Journal of Fish Biology 84: 1708-1720.

Gerald Hankins

1. Manohar S, Harlow M, Nguyen H, Li J, **Hankins GR**, Park M, Chromatin modifying protein 1A (Chmp1A) of the endosomal sorting complex required for transport (ESCRT)-III family activates ataxia-telangiectasia mutated (ATM) for PanC-1 cell growth inhibition. Cell Cycle 10 (15): 2529-2539, 2011 [PMID: 21705858]
2. Nimmakayala P, Abburi VL, Abburi L, Alaparthi SB, Cantrell R, Park M, Choi D, **Hankins G**, Malkaram S, Reddy UK, Linkage disequilibrium and population structure analysis among *Capsicum annuum* L. cultivars for use in association mapping. Molecular Genetics and Genomics 289 (4): 513-521, 2014 [PMID: 24585251]
3. Reddy UK, Almeida A, Abburi VL, Alaparthi SB, Unselt D, **Hankins GR**, Park M, Choi D, Nimmakayala P, Identification of gene-specific polymorphisms and association with capsaicin pathway metabolites in *Capsicum annuum* L. collections. PLOS One 9: e86393, 2014 [PMID: 24475113]

Robert Harris

1. Gary Hunter and **Robert T. Harris**. Structure and Function of the Muscular, Neuromuscular, Cardiovascular, and Respiratory Systems (chapter 1). In: Essentials of Strength Training and Conditioning. Third edition, Human Kinetics, (R. Earle, ed.) pp. 3-19. (2009)
2. Kevin M. Rice, Sunil K. Kakarla, Sriram P. Mupparaju, Anhaiah Katta, Miaozon Wu, **Robert T. Harris** and Eric R. Blough . Shear stress activates Akt during vascular smooth muscle cell reorientation. Biotechnology and Applied Biochemistry 55: 85-90, 2010
3. Rahul P. Nagmal, James R. Tchabo, Eric R. Blough, **Robert T. Harris**, Resveratrol attenuates fluprostenol induced hypertrophy of vascular smooth muscle cells. Biophysical Journal 98(3) Supplement 1: 4330, 2011.

David Huber

1. Shade, A., Peter, H., Allison, SD, Baho, DL, Berga, M., Burgmann H., **Huber DH**, Langenheder, S., Lennon, JT, Martiny JBH, Matulich KL, Schmidt TM, and Handelsman J. 2012. Fundamentals of microbial community resistance and resilience. Frontiers in Microbiology 3:417. (doi:10.3389/fmicb.2012.00417)
2. Alvarado A, Nafarrate E, **Huber D**, Balagurusamy N (2012) Microbiología de la digestión anaerobia. In Balagurusamy N, Das KC (ed), Avances Tecnologicos en la Produccion de Biogas: Perspectives y Retos. Lap Lambert Academic Publishing, Saarbrücken, Germany.
3. Sharma, D., Espinosa-Solares, T., **Huber, DH**. 2013. Thermophilic anaerobic co-digestion of poultry litter and thin stillage. Bioresource Technology. 136:251-256.

4. Smith, A.M., Sharma, D., Lappin-Scott, H., Burton, S., **Huber, D.H.** 2014. Microbial community structure of a pilot-scale thermophilic anaerobic digester treating poultry litter. Applied Microbiology and Biotechnology 98(5):2321-2334. (doi 10.1007/s00253-013-5144-y).
5. Rivera-Salvador, V., I.L. Lopez-Cruz, T. Espinosa-Solares, J.S. Aranda-Barradas, D**.H. Huber**, D. Sharma, J.U. Toledo. 2014. Application of Anaerobic Digestion Model No. 1 to describe the syntrophic acetate oxidation of poultry litter in thermophilic anaerobic digestion. Bioresource Technology 167:495-502.

Umesh Reddy

1. Nimmakayala P, Tomason Y, Jeong J, Vajja G, Levi A, Gibson P, **UK. Reddy**.2009. Molecular diversity in the Ukrainian melon collection as revealed by AFLPs and microsatellites. Plant Genetic Resources 7: 127-134.
2. Nimmakayala P, Jeong J, Tomason Y, Levi A, Ramasamy P, **UK. Reddy**.2010. Genetic reticulation and interrelationships among *Citrullus* species as revealed by joint analysis of shared AFLPs and species-specific SSR alleles. Plant Genetic Resources 8 (1): 16-25.
3. Nimmakayala P, Faridi NI, Tomason YR, Lutz F, Levi A and **U K. Reddy**. 2011. Citrullus. (Book chapter). Wild Crop Relatives: Genomic and Breeding Resources, Vegetables. Springer-Verlag, Berlin Heidelberg. Pages 59-66.
4. **Reddy UK**, Rong JK, Nimmakayala P, Vajja G, Rahman M, Yu JZ, Soliman K, Heller-Uszynska K, Kilian A, and Paterson A.H. 2011. Use of DArT markers for integration into cotton reference map and anchoring to a RIL map. Genome 54(5): 349-359.
5. Guru J, Nimmakayala P, Zheng Y, Gouda K, **Reddy U** and Sunkar R. 2012. Characterization of the small RNA component of the transcriptome in leaves and fruits of four cucurbits revealed dynamic regulation of conserved and novel miRNAs. BMC Genomics, 13:329.
6. Dawei Li, Jordi Garcia-Mas, Juan Zalapa, Jack E Staub, **Umesh K. Reddy**, Xiaoming He, Zhenhui Gong, Yiqun Weng 2011. Syntenic Relationships between Cucumber (Cucumis sativus L.) and Melon (C. melo L.) chromosomes as revealed by comparative genetic mapping. BMC Genomics 2011, 12:396
7. Manohar S., Jagadeeswaran G., Nimmakayala P., Tomason Y., Almeida A., Sunkar R., Levi A., **Reddy UK**. (2012) Dynamic regulation of novel and conserved miRNAs across various tissues of diverse Cucurbit species. Plant Mol. Biol. Rep ;31 335-343
8. Levi A, Thies J A, Wechter P, Harrison HF, Simmons AM, **Reddy UK**, Nimmakayala P, and Fei Z. 2013. High frequency oligonucleotides: targeting active gene (HFO-TAG) markers revealed wide genetic diversity among *Citrullus* spp. accessions useful for enhancing disease or pest resistance in watermelon cultivars. Genet Resour and Crop Evol, 60, 427-440.
9. Tomason Y, Nimmakayala P, Levi A and **Reddy U**.2013. Map-based molecular diversity, linkage disequilibrium and association mapping of fruit traits in melon. Mol Breeding (doi:10.1007/s11032-013-9837-9).
10. Paterson AH, Wendel JF, Gundlach H, Guo H, Jenkins J, Jin D, Llewellyn D, Showmaker KC, Shu S, Udall J, Umesh K. Reddy et al 2012. The cotton genomes, their polyploidies, and the evolution of spinnable fibers. Nature. DOI:10.1038/nature11798
11. Nimmakayala P, Vajja G, Gist R, Tomason YR, Levi A, **Reddy UK**.2011. Effect of DNA methylation on molecular diversity of watermelon heirlooms and stability of methylation specific polymorphisms across the genealogies. Euphytica. 177: 79-89.
12. Hussain, A. J., Ali, J., Siddiq, E. A., Gupta, V. S., **Reddy, U. K**., and Ranjekar, P. K. (2012) Mapping of tms8 gene for temperature-sensitive genic male sterility (TGMS) in rice (Oryza sativa L.), Plant Breeding 131, 42-47.
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14. **Umesh K. Reddy**, Nischit Aryal, Nurul Islam-Faridi, Yan Tomason, Amnon Levi and Padma Nimmakayala. 2013. Cytomolecular characterization of rDNA distribution in various *Citrullus* species using fluorescent in situ hybridization. Genetic Resources and Crop Evolution. DOI 10.1007/s10722-013-9976-1.

15. Djanaguiraman M, Vara Prasad PV, Murugan M, Perumal R, **Reddy UK** (2014) Physiological differences among sorghum (*Sorghum bicolor* L. Moench) genotypes under high temperature stress. Environmental and Experimental Botany 100, 43-54.
16. Tomason Y, Nimmakayala P, Levi A and **Reddy UK**. 2013. Map-based molecular diversity, linkage disequilibrium and association mapping of fruit traits in melon. Mol Breeding, 31(4): 829-841 (doi: 10.1007/s11032-013-9837-9).
17. **Reddy, U. K**., A. Almeida, V. L. Abburi, S. B. Alaparthi, Nimmakayala P et al., 2014. Identification of Gene-Specific Polymorphisms and Association with Capsaicin Pathway Metabolites in *Capsicum annuum* L Collections. PLoS ONE 9: e86393.
18. Nimmakayala, P., Abburi VL, Abhishek Bhandari, Lavanya Abburi, Venkata Gopinath Vajja, Rishi Reddy, Sridhar Malkaram, Pegadaraju Venkatramana, Asela Wijeratne, Yan. R. Tomason, Amnon Levi, Todd C. Wehner, and **Reddy UK**. 2014. Use of VeraCode 384-plex assays for watermelon diversity analysis and integrated genetic map of watermelon with single nucleotide polymorphisms and simple sequence repeats. Molecular Breeding, DOI 10.1007/s11032-014-0056-9.
19. Nimmakayala, P., Venkata l. Abburi, Lavanya Abburi, Suresh Babu Alaparthi, Robert Cantrell, Minkyu Park, Doil Choi, Gerald Hankins, Sridhar Malkaram and **Reddy UK**. 2014. Linkage disequilibrium and population structure analysis among *Capsicum annuum* L. cultivars for use in association mapping. Molecular Genetics and Genomics, DOI 10.1007/s00438-014-0827-3.
20. **Reddy UK**, Nimmikayala P, Levi A, Abburi VL, Saminathan T, Tomason YR, Vajja G, Reddy R, Abburi L, Wehner TC, Ronin Y, Karol A. 2014 High-Resolution Genetic Map for Understanding the Effect of Genome-Wide Recombination Rate on Nucleotide Diversity in Watermelon. G3: Genes|Genomes|Genetics. doi: 10.1534/g3.114.012815.
21. Padma Nimmakayala, Amnon Levi, Lavanya Abburi, Venkata Lakshmi Abburi, Yan R. Tomason, Thangasamy Saminathan, Venkata Gopinath Vajja, Sridhar Malkaram, Rishi Reddy, Todd C. Wehner, and **Umesh K. Reddy** 2014. Single nucleotide polymorphisms generated by genotyping by sequencing used to characterize genome-wide diversity, linkage disequilibrium and selection sweep for worldwide cultivated watermelon. BMC Genomics 2014, 15:767 (Highly accessed)

Timothy Ruhnke

1. **Ruhnke, T. R.** and R. E. Workman. 2013. Two new species and a new phyllobothriid cestode genus from sharks of the genus *Negaprion* Whitley (Carcharhiniformes). Systematic Parasitology 85: 37-48.
2. **Ruhnke, T.R.** 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.
   Caira, J. N., M. Malek, and **T. Ruhnke**. 2010 A new genus of Phyllobothriidae (Cestoda: Tetraphyllidea) in carcharhiniform sharks from Iran and Australia. Journal of Helminthology. 85: 40-50.
3. **Ruhnke, T. R.** and H. D. Seaman. 2009. Three new species of *Anthocephalum* Linton, 1890 (Cestoda: Tetraphyllidea) from dasyatid stingrays of the Gulf of California. Systematic Parasitology 72: 81–95.
4. **Ruhnke, T. R.** and J. N. Caira. 2009. Two new species of *Anthobothrium* van Beneden, 1850 (Tetraphyllidea: Phyllobothriidae) from carcharhinid sharks, with a redescription of *Anthobothrium laciniatum* Linton, 1890. Systematic Parasitology 72: 217–227.
5. 2010- present. WVSU Faculty Coordinator, NSF EPSCoR RII, "Bionanotechnology for Public Security and Environmental Safety".
6. 2008-2014. Collaborator – NSF PBI: A survey of the tapeworms (Cestoda: Platyhelminthes) from the vertebrate bowels of the earth. NSF (J.N. Caira P.I.).
7. **Ruhnke, TR**, Caira, JN and Cox, A. 2015. The cestode order Rhinebothriidea no longer family-less: A molecular phylogenetic investigation with erection of two new families and description of eight new species of *Anthocephalum*. Zootaxa 3904: 51–81.
8. **Ruhnke, T.R**. 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.

Barbara Liedl

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2. Anderson, N.O., S. Poppe, P.D. Ascher, E. Gesick, S. Yao, D. Wildung, P. Johnson, V. Fritz, J. Hebal, L. Klossner, N. Eash, **B.E. Liedl**, and J. Reith-Rozell. (2012). Mammoth™ 'Yellow Quill' Garden Chrysanthemum. HortScience 47(2):285-288.
3. Anderson, N., L. Klossner, N. Eash, V. Fritz, M. Wang, S. Poppe, J. Reith-Rozell, D. Wildung, S. Yao, P. Johnson, and **B. E. Liedl**. (2008). *Gaura lindheimeri* 'Snowstorm': A new Z6 Heat/frost-tolerant Container and Landscaping Perennial. HortScience 44(5): 1481-1483

Exhibit D: Grants Awarded to Faculty of the Biotechnology Graduate Program Awarded from Summer 2009 through Spring 2014

Date	Project	Agency	Amount	Faculty or Researcher
2009	Bioplex 9	USDA	$453,175	Huber
2009	Organic Seeds / sub	USDA	$ 9,004	Liedl
2009	INBRE-Harris	NIH	$683,000	Harris
2009	EPSCoR Track 1 Supplemental	NSF	$ 86,832	Ruhnke, et. al*
2009	EPSCoR CI-TRAIN	NSF	$581,890	Toledo, Reddy
2009	SURE	HEPC	$ 60,060	Harper
2010	Tomato Blight	USDA	$ 9,004	Liedl
2010	WV-INBRE	NIH	$ 9,000	Harris
2010	NE SARE	USDA	$ 15,000	Liedl
2010	WVDA – Specialty Crop	USDA	$ 6,882	Liedl
2010	Bioplex II	USDA	$468,000	Huber, Toledo
2010	SURE 2010	HEPC	$ 30,000	Harper
2010	INBRE	NIH	$172,525	Hankins
2010	INBRE	NIH	$173,793	Harris
2010	CBG – Crop Evolution	USDA	$299,986	Padma Nimmakayala
2010	CBG – Value Added Peppers	USDA	$299,937	Hankins
2010	CBG – Microbial Communities	USDA	$564,000	Huber
2010	EPSCoR RII Bionanotech	NSF	$500,000	Ruhnke, et. al*
2011	NE-SARE WV Outreach	USDA	$ 15,000	Liedl
2011	INBRE - MU	NIH	$ 24,760	Hankins
2011	EPSCoR RII Bionanotech yr. 2	NSF	$490,000	Ruhnke, et. al*
2011	CBG - Trout	USDA	$295,663	Eya
2011	Sol. CAP Yr. 3, Mich. State sub	USDA	$ 6,250	Liedl
2012	INBRE	NIH	$174,476	Hankins
2012	INBRE	NIH	$ 17,700	Hankins
2012	CBG - Teaching	USDA	$149,583	Harris, Reddy, Ford
2012	CBG - CGIAR	USDA	$299,811	Reddy, Chatfield, Padma
2012	CBG - Tomatoes	USDA	$299,734	Liedl
2012	CBG - Pumpkins	USDA	$299,832	Padma, Reddy, Harris
2012	EPSCoR RII Bionanotech yr. 3	NSF	$485,000	Ruhnke, et. al*
2012	Step To Success	NSF	$499,248	Byers, Harper
2012	CBG - Mine Sites	USDA	$242,954	Huber, Reddy, Barry, Hass
2013	CBG Alcorn St. Sub	USDA	$293,497	Padma, Reddy
2013	EPSCoR mentoring Sub	NSF	$ 10,000	Hankins
2013	CBG – Hibiscus 2 Sub	USDA	$ 50,000	Hankins
2013	INBRE Summer teacher	NIH	$ 20,000	Hankins
2013	INBRE	NIH	$174,530	Hankins
2013	EPSCoR RII Bionanotech yr. 4	NSF	$485,000	Ruhnke, et. al*
2013	CBG - Watermelon	USDA	$444,346	Reddy
2013	CBG – Plant Breeding	USDA	$120,000	Padma, Reddy
2013	Farmer Outreach	USDA	$ 4,996	Liedl
2014	INBRE Nat. Products	NIH	$ 26,560	Harris
2014	SURE 2014	HEPC	$ 76,000	Harper
2014	Instrumentation - Analyzer	DOD	$156,336	Eya
2014	INBRE Equipment	NIH	$ 72,091	Hankins
2014	CBG – Mushrooms - sub	USDA	$ 22,370	Hankins **= $9,556,094**

Exhibit E: Response from the 2009 Program Review of the Biotechnology Graduate Program

ACADEMIC PROGRAM REVIEW

2009-10

Institutional Response Form

Program: Master of Science and Master of Arts in Biotechnology **Date:** May 28, 2010

Type of Review: X Comprehensive Self-Study
Follow-Up / Progress Report

Recommendation to the Board of Governors:

X **1.** Continuation of the program at the current level of activity with specific action as described in the Rationale section of this Form;

2. Continuation of the program at a reduced level of activity (e.g., reducing the range of optional tracks, merging programs, etc.) or other corrective action as described in the Rationale section;

3. Identification of the program for further development (e.g., providing additional institutional commitment);

4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;

5. Discontinuance of the Program according the provisions of Higher Education Policy Commission (Section 8.1, Series 11, Title 133)

6. Other. Specify.

Rationale for Recommendation:

The Committee recommends the Master in Biotechnology programs be continued at the current level of activity with specific action. The committee commends the program for almost full implementation of program offerings and production of sixteen graduates during the review period. Strengths of the program include the productive faculty with substantial grant funded research and collaboration with other institutions of higher education. Additional strengths include mentoring of graduate students and graduates who are employed in their major field or have gained admittance to other graduate/professional programs. The weaknesses of the program include no assessment plan (and therefore, no data), limited space and limited administrative support.

Therefore the Committee recommends specific action that a follow-up report due January 2012, with a detailed and viable assessment plan with evidence of implementation including data collection

I concur with the recommendation of the Program Review Committee.

R. Charles Bryan
Signature of Chief Academic Officer

May 28, 2010
Date

Hazo W. Carter
Signature of President

6-11-10
Date

Exhibit F: Plan of Correction Resulting from the 2009 Program Review of the Biotechnology Graduate Program

The Biology Department has several, related weak links in an otherwise strong chain. We lack program-level assessment, we have no organized system for keeping track of our alumni, our outreach and recruitment are piecemeal-to-neglected, and we don't publicize. More personnel would solve all these problems, but the plan adopted by the Biology Faculty is as lean as can be and still succeed.

In this plan, all departmental weakness are addressed can be handled by two committees (each with a Chair who has the resources to do the job), a Graduate Outreach Assistant (20 hours per week), and a vibrant, interactive web page.

This Plan of Correction was formally approved by the Biology Department Faculty at our meeting of November 13, 2009. Draft minutes are included here.

Committee on Expectation, Standards, Assessment:

Why: The CESA helps the Biology Department / Biotechnology Graduate Program fulfill its Mission through review / deliberation / recommendation / assistance in improvement.

Who: CESA Chair (a member of the Biology Faculty); Biology Faculty rep(s), Biology Chair, NSM Faculty rep, WVSU Faculty rep, Biology Student rep, Biotech Grad Student rep (GSA rep), alum + employer rep(s), invited guests.

Tasks: compare the Department's Mission with its performance, write / grade / review Freshman and Senior Standards Exams, review Annual Report, review Student Polls, review Employer Surveys, review any appropriate Departmental info, participate in Biology Department / Biotech outreach, post to The Lobby, make any recommendations to Biology Chair, set its own operating rules

Operations: This is a deliberative body which oversees the long-term ability of the Department to achieve its mission. It meets as needed, meets at least once a semester, monitors The Lobby, certain members (ex. student member) may be excluded from specific tasks, may ask Biology Chair for any appropriate info (etc.), typically Biology Chair provides data summaries (unless committee asks for raw data), CESA subordinate to nobody and may talk to anybody (ethical and personnel issues being considered), primary contact with Biology Department / NSM / WVSU is Biology Chair, reports / minutes go in Biology Department Annual Report, CESA Chair has 1/3 release time

Committee on Departmental Relations:

Why: The CDR helps the Biology Department / Biotechnology Graduate Program fulfill its Mission by gathering and sharing info and views throughout the Department, alumni, employers / involving all members of the Department in discussion / helping the Department improve.

Who: CDR Chair (a member of the Biology Faculty); NSM Secretary, NSM Financial, Biology Chair, Biotech rep (Chair Graduate Admission Committee), Biology Student reps (2; DNA Club), Biotech Grad Student reps (GSA rep and GOA), Biology Faculty reps (2), NSM rep, invited guests

Tasks: daily posting and upkeep of The Lobby (web page), web site upkeep, alumni contact and records, department open house held each semester, outreach to local public schools, PR (ex. write articles to newspapers), recruitment, other social events, review results of polling from The Lobby, make any recommendations

operations: meets as needed, meets at least once a month, individual committee members volunteer to do specific tasks, primary contact with Biology Department / NSM / WVSU is Biology Chair, CDR Chair has 1/3 release time

New items in this plan:

- A Biology Department Committee on Expectations, Standards and Assessment
- A Biology Department Committee on Departmental Relations
- A Graduate Outreach Assistant (20-hour paid assistantship devoted to these tasks, tuition waiver)
- "The Lobby" webpage (This is no small part of the plan. It will be the hub of announcements, departmental info, events, camaraderie, feedback, polling, etc. Picture a newspaper's web page)
- Regular / ongoing polling of students, alumni, employers on The Lobby (subsumes Electives Surveys, Employer Surveys, etc.)
- Release time for CDR Chair and CESA Chair (1/3 each) or paid overload
- Freshman Biology Standards Exam (done in NSM 101) and a Senior Biology Standards Exams (done in Biol 411). We can either write our own or find a national standard test.
- Database of alum: data entered by Administrative Secretary, technical support by Chair CDR (or designee), coordination with WVSU Alumni Relations, data continually updated, frequent contact through The Lobby, yearly contact through US mail, Faculty send alumni info to Administrative Secretary for entry into database
- Regular (each semester) department open houses or other activities (tour, seminars, fac vs. students competitions, dinners)

Specific, long-term tasks:

CESA: will be set up in spring 2010, continue forever, cover its tasks, the CESA Chair should expect to work 5+ hours per week

CDR: will be set up in spring 2010, continue forever, cover its tasks, the CESA Chair should expect to work 5+ hours per week

GOA: Faculty will find, recruit, train as needed, Biology Chair (as Director of the Biotechnology Graduate Program) will supervise, mentor

alumni contact data base: will be set up in Fall 2009, maintained by Chair of CDR, updated whenever anyone gets alumni info and sends it to Chair of CDR

Freshman and Senior Standards Exams: will be developed and implemented in spring 2010, administered each semester in Biol 411, updated by CESA as needed

The Lobby: will be implemented in spring 2010 (pending approvals), only designated Faculty and Staff may post directly, anyone may post as approved by designated Faculty (Chair CDR or designee), GOA, CDR rep and Computer Services do technical support, daily updates, regular polling of students, alumni, employers (replaces the current Electives Survey instrument, used for Employer Survey, etc.)

Exhibit G: **Graduate Student Manual** *April 8, 2014*
Biotechnology Graduate Program
West Virginia State University

Academic Year 2013 - 2014

Table of Contents **Page**

This manual is intended for Graduate Students and Faculty in the Biotechnology Graduate Program at West Virginia State University. It is an un-official guide to procedures and policies; it is not a contract, nor does it replace or supersede WVSU regulations.

1. Program Introduction and Overview

The West Virginia State University Biotechnology Graduate Program offers two degrees: a Master of Science in Biotechnology (with student research culminating in a thesis) and a Master of Arts in Biotechnology (coursework only). At this time, we offer no doctoral program.

In Fall 2003, the Department of Biology at West Virginia State College launched a graduate program in Biotechnology. The Biotechnology Graduate Program at WVSU is a unique program in the life sciences that emphasizes skills that a 21st century biologist will need. The goal of the Master's Degree Program in Biotechnology is to provide instruction in the broad field of biotechnology, as well as specialized training in the current concepts and technological advances of sub-disciplines of biotechnology. Students learn state-of-the-art biotechnology and use acquired techniques to conduct research that addresses environmental, agricultural and biomedical issues. In addition, our affiliation with the Research Scientists of the Gus R. Douglass Institute for Land Grant Research provides opportunities to choose from a surprisingly diverse variety of research projects.

The Biotechnology Graduate Program is physically and administratively housed within the WVSU Department of Biology.

Curriculum for Master of Biotechnology Degrees (MS and MA)

Successful completion of the Biotechnology Graduate program leads to either a Master's of Science in Biotechnology or a Master of Arts in Biotechnology. The M.S. component of the program prepares students for continued graduate education in an area of the life sciences or diverse careers in the Biotechnology, Pharmaceutical, and Environmental Sciences; and Health Care industries. The M.S. track requires the development and completion of an independent research project. Secondary Education professionals can also take advantage of the program by pursuing an M.A. (non-thesis) in Biotechnology. This track allows students to choose from a variety of elective courses to meet program requirements.

We divide the broad field(s) of Biotechnology into two areas of concentration: Organismal / Environmental and Molecular / Microbial. Biotechnology education is built on five core courses: Current Concepts in Biotechnology (lecture), two semesters of Techniques in Biotechnology (lab), Biostatistics, and Biotechnology Seminar. All students teach two sections of undergraduate courses.

The MS Degree continues with four electives in your chosen area of concentration, plus research, writing, defense, and public presentation of your own Master's Degree thesis work.

The MA degree continues with six electives in your chosen area of concentration, plus a comprehensive exam covering your Master's coursework. A graduate student who is unable to enter a lab (and therefore cannot earn a MS degree) may opt to pursue an MA degree instead.

Graduate Certificate in Biotechnology

The WVSU Biotechnology Graduate Program offers a Graduate Certificate in Biotechnology. This 12-credit, coursework-based (i.e. no research or thesis requirements) certification is especially intended for public school teachers who wish to update their knowledge of current Biotechnology and get their certification renewed. The Certificate consists of the core courses of the Program. Details are given in Appendix K, page 36. Contact Biotechnology Program Coordinator Dr. Richard Ford if you would like to discuss details such as when classes will be offered. And if you would like to speak with the faculty who teach these courses, or if you would like to sit in on a class, etc., let's talk. To apply, contact the Registrar, Ms. Donna Hunter, hunterdl@wvstateu.edu, 304-766-4146.

Program Contact Information

Administrative Secretary	Ms. Glenna Curry	304-766-3102	gcurry4@wvstateu.edu
Academic Program Associate	Ms. Audrana Austin	304-766-5778	aaustin1@wvstateu.edu
Assistant to the Dean of NSM	Ms. Allison Meadows	304-766-3132	acox5@wvstateu.edu
Biotech Program Coordinator	Dr. Richard Ford	304-766-5742	fordri@wvstateu.edu
Dean, College of Natural Sciences and Math	Dr. Katherine Harper	304-766-3142	harperkl@wvstateu.edu
Program web site	http://www.wvstateu.edu/Academics/Colleges/College-of-Natural-Sciences-and-Mathematics/Biotechnology-(1).aspx		
Program mailing address	101 Hamblin Hall West Virginia State University PO Box 1000 Institute, WV 25112-1000		
Program fax	304-766-5244		

Biotechnology Graduate Faculty and their research programs

Dr. Kevin Barry — Ecology of invasive plants **kbarry@wvstateu.edu**

Dr. Mark Chatfield — Plant Physiology, Microbiology, Molecular Biology **chatfield@wvstateu.edu**
Dr. Chatfield's lab is interested in the interaction between microflora of the soil and trees, particularly with respect to reclamation of strip mines.

Dr. Sean Collins — Social Insect Biology, Insect Population Biology, Ecology **scollin5@wvstateu.edu**
Dr. Collins' lab uses molecular approaches to define population distributions of social wasps.

Dr. Jonathan Eya — Fish Biology and Nutrition, Aquaculture, Nutrigenomics, Nutritional Immunology **eyajc@wvstateu.edu**
Dr. Eya's lab is interested in applied aquaculture, and is currently exploring mitochondrial gene expression relative to nutrition.

Dr. Richard Ford — Principles of Biology, Fundamentals of Biology, Microbiology **fordri@wvstateu.edu**

Dr. Gerald Hankins — Tumor Biology, Gene Therapy **ghankins@wvstateu.edu**
Dr. Hankins' lab studies aspects of meningioma biology, including gene therapy and the effects of exogenous chemicals (ex. progesterone) on gene expression.

Dr. Katherine Harper — Dean of the College of Natural Sciences and Mathematics.
Genetics, Cell Biology, Virology **harperkl@wvstateu.edu**

Dr. Rob Harris — Muscle Physiology **harrisro@wvstateu.edu**
Dr. Harris studies the response of smooth muscle cytoskeletal response to stimuli such as mechanical stress and nutritional chemicals (ex. resveratrol).

Dr. David Huber — Environmental Microbiology, Environmental Microbial Genomics, Microbial Diversity, Biofilms, Anaerobic Digestion **huberdh@wvstateu.edu**
Dr. Huber's lab uses molecular approaches to characterize the identity and function of microbial communities in poultry waste treated in a thermophilic anaerobic digester.

Dr. Barbara Liedl	Associate Research Professor. Plant Breeding and Genetics, Horticulture, Plant Reproductive Barriers, Speciation, Sustainable Agriculture **liedlbe@wvstateu.edu** *Dr. Liedl's lab is developing insect and disease resistant tomato varieties for greenhouse and high tunnel production using marker assisted selection. Her lab also works on reproductive barriers between cultivated tomato and their wild species to assist in transfer of resistance traits. Additional research includes variety trials and sustainable agriculture production methods for small producers.*
Dr. Padma Nimmakayala	Research Scientist and Assistant Professor: Quantitative Genetics, DNA marker-assisted plant breeding **padma@wvstateu.edu** *Dr. Nimmakayala's research focuses on molecular marker development, genetic and physical mapping, marker assisted selection in vegetable crops (pepper, watermelon, sweetpotato and other cucurbits).*
Dr. Umesh Reddy	Plant Genomics, Biotechnology **ureddy@wvstateu.edu** *Dr. Reddy's lab specializes in genomics of significant traits in commercially important plants, including cotton, peppers, melons.*
Dr. Tim Ruhnke	Systematics and Evolution of Parasitic Platyhelminths, Environmental Parasitology **ruhnketr@wvstateu.edu** *Dr. Ruhnke studies the phylogeny and evolution of tapeworms in sharks and rays, using both traditional phenotypic characterization as well as molecular (rDNA) approaches.*

2. How to Apply to the Program

The WVSU Biotech Program accepts applicants twice a year: at the start of the Fall semester (typically in mid-August) and at the start of the Spring semester (typically in mid-January). See the WVSU Biotech web site for upcoming deadlines dates. We accept all qualified applicants. However, we can fund only a limited number of assistantships.

What's the process?

Send us your completed application. Consult the Application Checklist (Appendix A). Do this by the due date.

If you want to know if we have received your application materials, contact

1. Ms. Allison Meadows, Assistant to the Dean of NSM acox5@wvstateu.edu 304-766-3132
2. Ms. Audrana Austin, Academic Program Associate aaustin1@wvstateu.edu 304-766-5778

Soon after the deadline date, the WVSU Biotech Faculty meet and review all applications. We determine how many GTAs and GRAs will be available for incoming students. Then we make our best decisions from among the applicants. We rarely make decisions before the application deadline date has passed, but we wouldn't rule it out for an exceptional applicant.

We will contact you, regardless of the decision. We will inform you (both via email and on official WVSU stationary) if you have been accepted into the Program and if you have been offered an assistantship. Details such as the amount of the stipend, starting dates for classes, necessary paperwork, etc. will be provided in the notification letter.

If you accept, you must let us know (see Appendix E: Letter of Intent). Contact Ms. Austin.

What can an applicant do to be most competitive?

Begin the application process early. Allow plenty of time for lost documents, slow references, complicated visa arrangements, etc. Be proactive in ensuring that your application is complete (see Application Checklist, Appendix A). An incomplete application may not disqualify you, but it significantly hurts your chances. We get good applicants to choose from.

Contact research faculty members. Find out if there is a faculty member you want to work with, and if that faculty member will accept you into his/her laboratory. All things being equal, a candidate who has already been accepted into a research lab will beat one who has not. Remember: acceptance into the Program does not guarantee acceptance into a research lab.

Although we will consider any applicant with a "strong background in biological sciences and physical sciences", we are especially interested in applicants who already possess basic lab skills, and who have an up-to-date knowledge of genetics, molecular biology, biochemistry and physiology.

Good English is a must! You must be able to communicate, both verbally and orally, in reasonably-correct, understandable English. All classroom instruction is in English, your thesis will be in English, and all Biotech Graduate students must teach at least two sections as a GTA. So you must demonstrate to us that your English is solid.

3. Graduate Teaching Assistantships and Graduate Research Assistantships

Policies

Almost all WVSU Biotech graduate students are supported by either a Graduate Teaching Assistantship (GTA) or a Graduate Research Assistantship (GRA). In AY 2013-2014, we have 10 GTA positions and 10 GRA positions. Our GTAs teach half-time, which (for a team of two GTAs) means four sections of teaching labs (eight teaching hours, plus 12 hours of preparatory time) per week. Our GRAs are also half-time (20 hours per week), and the nature of each GRA varies with the particular lab in which the GRA works.

Graduate Assistantships include full tuition coverage and stipends of $12,000 per academic year. Currently, there are about $400 per year of fees that are not covered by WVSU; however, the Program often has ways to help.

The Biotech faculty expect that most graduate students will complete their degree in two years. Although we do not guarantee support for two years, we make every effort to do so, provided the student is making acceptable progress through the Program.

Graduate Assistantships are awarded to students without regard to financial status, race, sex, age, color, religion, disability, national origin or ethnic origin. In order to be eligible for assistantships, you must be enrolled full-time (9 credit hours).

Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen. See Section 6 of this Manual for these deadlines.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Office assignments are made at the discretion of the Coordinator, in space made available by the Dean. Graduate students should not need to be told that, in all locations in Hamblin Hall, they are expected to behave as professional academics and scientists. As office space in Hamblin Hall is limited, priority for offices will be given to GTAs over GRAs. Mailboxes are provided in the main Biology office, Hamblin Hall room 101. Be sure to check them regularly, even daily.

Graduate Teaching Assistantship (GTA) awardees are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters, not counting summers.

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught. In addition, The Coordinator and Dr. Kevin Barry will observe teaching by new GTAs, as well as any other GTAs who bear further observation. Graduate Teaching Assistantships are awarded on a single-semester basis, but are renewable.

Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). Renewal of the GTA is contingent upon acceptable performance (see Appendix I, Renewal / Continuation of Graduate Teaching Assistantship).

GTAs are permitted to purchase Faculty / Staff parking permits.

Graduate Research Assistantships (GRA) are available through various funding sources. Some Biotechnology Graduate Faculty are able to employ GRAs through their individual grants monies. For details, contact the faculty member who sponsors the assistantship.

Several GRAs are available to support researchers who work with the Gus. R. Douglass Institute (GRDI). Recipients of these "Evans Allen / GRDI" GRAs are recommended by the individual researcher, nominated by the Biotechnology Graduate Faculty, and selected by the Douglass Institute. The Douglass Institute first notifies the Biotechnology Faculty of the number of funded GRA positions. The Faculty subsequently provide the Douglass Institute administrators with a ranked list of candidates. This ranking is based on such factors as the academic preparedness of the candidates and a fair distribution of GRA positions among eligible labs. The Douglass Institute notifies the Coordinator of the awardees.

Graduate Research Assistantships are awarded on a single-semester basis, but are renewable.

GRAs are not issued Faculty / Staff parking permits.

Procedures for Getting a Graduate Teaching Assistantship

The Graduate Teaching Assistant (GTA) should see Mrs. Audrana Austin (Academic Program Associate) to complete this process. A new application must be completed each semester.

Ms. Austin will help you prepare a "Letter of Intent" each semester. Ms. Austin will guide you through all necessary paperwork.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Note that some GTAs receive actual tuition waivers, while others have their tuition paid by other mechanisms / funding sources (ex. Academic Affairs). Although we tend to refer to all of these as "tuition waivers", the term is not accurate for most GTAs.

Procedures for Getting a Graduate Research Assistantship

The Graduate Research Assistant (GRA) should see Mrs. Audrana Austin (Academic Program Associate) to complete this process. A new application must be completed each semester.

Ms. Austin will help you prepare a "Letter of Intent" each semester. Ms. Austin will guide you through all necessary paperwork.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Note that some GRAs receive actual tuition waivers, while others have their tuition paid by other mechanisms / funding sources (ex. Academic Affairs). Although we tend to refer to all of these as "tuition waivers", the term is not accurate for most GRAs.

4. Program Requirements

Biotechnology Program Core classes 12 credits of Core classes:

BT 511	Biotechnology Seminar	2 credits total (1 credit for each of two semesters)
BT 555	Statistics	3 credits
BT 567	Current Concepts in Biotechnology	3 credits
BT 571	Techniques in Biotechnology I	2 credits
BT 572	Techniques in Biotechnology II	2 credits

Biotechnology Program areas of concentration

Organismal / Environmental

Choose elective courses from Biol 510, Biol 521, Biol 550, Biol 565, Biol 575, Biol 605, Biol 635, Biol 660, Biol 671, BT 598, BT 599, Chem 512.

Molecular / Microbial

Choose elective courses from Biol 550, Biol 561, Biol 660, Biol 635, Biol 671, BT 598, BT 599, Chem 512, Chem 525, Chem 531, Chem 533.

MS Degree Requirements

30 total credit hours
12 credit hours of biotechnology program core courses
12 credits elective classes in one of the two areas of concentration
6 credit hours of graduate research BT 695 Master's Thesis Research

Research Advisor must be a member of WVSU Biotechnology Graduate Faculty
Thesis Committee is composed of the Research Advisor plus at least two other faculty (one may be an Affiliate Graduate Faculty member)
The Research Adviser and the student's Thesis Committee will assist the student in developing the plan of study for the MS degree and thesis proposal. The student's Thesis Committee must accept both.
a minimum of two sections of graduate teaching experience (even if you're not a GTA)
oral defense of thesis, public presentation of thesis research, hard-copy of thesis accepted by the WVSU Library

MA Degree Requirements

36 total credit hours
12 credit hours of biotechnology program core courses
24 credits elective classes in one of two areas of concentration

No thesis required
A minimum of two sections of graduate teaching experience (even if you're not a GTA)
Written and/or oral comprehensive examination over the course work

Because all Graduate Students are required to teach at least two sections, and because many Graduate Students will be employed as Graduate Teaching Assistants, we strongly encourage all Graduate Students to enroll in the elective **"Seminar for Teaching Assistants"** (BT 501, 1 credit) as early in the Program as possible. One credit of BT 501 counts as a Biotechnology elective.

5. Performance Standards

A normal course load is nine (9) credit hours for full time graduate students. General requirements for graduation vary depending up on the option being sought. All students must complete coursework with a cumulative GPA of 3.0 on a 4-point scale. Students must complete all requirements within a period of five years following the date of admission to the Program. The Dean of the College of Natural Sciences and Mathematics ("the Dean") may extend these limits upon recommendation of appropriate Program faculty member and approval of the Biotechnology Graduate Faculty.

Grading

The following grades are issued for graduate programs with the following GPA value:

A	4.0
B	3.0
C	2.0
F	0.0
I	incomplete

In courses applicable to graduate degrees, only the grades A, B, and S represent satisfactory scholarship.

Grade Point Average and Academic Disqualification

If a student in the Biotechnology Graduate Program receives a final grade of C in two courses in the Program (either Biotechnology courses or other courses required in his/her Plan of Study), that student will receive a Letter of Warning. If a student receives a third C in such courses, he/she will be dismissed from the Program. A final grade of F in a course is grounds for dismissal from the Program.

Academic Warning, Probation, Dismissal

Students may appeal final grades as described (for undergraduate students) in the WVSU Catalog.

The Biotechnology Program will tolerate no academic / professional misconduct. Un-acceptable behavior includes, but is not limited to: plagiarism, cheating, vandalism, fighting. Should anyone be found to have engaged in such behavior, we will immediately remove him / her from the Program, and the infraction will remain on file as part of that student's permanent academic record.

Incomplete Grades

The grade of I (Incomplete) is awarded at the discretion of the instructor upon the request of the student for work not completed because of a serious interruption not caused by the student' s own negligence. Faculty members reserve the right not to award an Incomplete. An incomplete grade is not to be assigned to thesis credits to indicate that the work is in progress. Conditions for completing the course work and having a grade assigned are set by the instructor. The work must be completed by the date decided by the instructor, but no later than the end of two semesters immediately following the semester in which the Incomplete was awarded. A student with two or more grades of I is not permitted to register until the work has been completed and the grade assigned.

Audit Grade

A student wishing an "Audit" grade in a course must officially register for the course. The student must also submit a written request to the instructor by the fourth week of class. The instructor’s decision will be final and will be transmitted to the student in writing. A student may re-register for the course at a later date and receive a grade and academic credit.

Master's Thesis Committee

The Committee consists of the student's Advisor as chair and at least two other members of the Graduate Faculty, one of who may be from outside the department. The Advisor will nominate the members of the Committee after consultation with the student. The Coordinator appoints the Committee members upon the request of the Advisor and sends written notification to the student, Committee members, and Dean. That said, the way it has been done in the Biotechnology Graduate Program is that the student and Advisor choose the Committee, and membership of the Committee is made official by getting signatures on the Graduate Student Checklist.

Thesis Work

"In progress" (IP), "satisfactory" (S) or "unsatisfactory" (U) or letter grades may be assigned each semester for thesis work, since these grades do not imply approval of the thesis itself.

In progress "IP" grades may be assigned to signify adequate progress on theses and projects in which continuous registration is required. All "IP" grades will automatically be changed to "S" grades by the Registrar upon final acceptance of the thesis and completion of all degree requirements.

Only MS candidates are required to write a thesis. The content and format will, for the most part, be determined by your Advisor and Master's Thesis Committee (the "Committee"). Be advised that writing your thesis will be time-consuming and difficult. Understand that your Advisor and Committee will not sign your thesis until they are satisfied with it.

Be aware that WVSU has set standards for theses, and specifies such particulars as the format of the thesis, how copies are to be prepared for binding, and deadlines for submission. If the Library finds that your thesis does not meet editorial guidelines and rejects your thesis, there is nothing we can do about it. Do not wait until the last minute to submit your thesis to the Library. See timelines for graduation, Section 6.

See the **Biotechnology Thesis Handbook** for further information about writing and submitting both the proposal and the thesis.

Repeat Courses

Graduate students may repeat no more than two courses, with no course being repeated more than once. The original grade will remain posted on the student's permanent record and both grades will be used to determine the student's GPA.

Active Status

Active status entitles students to utilize the University resources. Master's programs require a minimum of one credit hour per semester to maintain active status in the program.

Lapses in enrollment for three or more consecutive semesters require that the student apply for readmission subject to the admission procedures, criteria and policies in effect at the time the reapplication is made.

Thesis Enrollment Requirement

Once enrollment in thesis credit is initiated, continuous registration for at least one credit hour each semester (including the summer term) is required until the thesis requirement is fulfilled.

The Program has procedures that ensure that students in the program maintain satisfactory academic progress toward both the required grade point average and completion of degree requirements. Graduate students are herein informed of these procedures at the time they are admitted. The Program Coordinator is responsible for monitoring program compliance with this requirement.

Leave of Absence

A student who finds it necessary to be excused from registration in a graduate degree program for three or more consecutive semesters must formally request a leave of absence from the graduate program. Leave time must be approved by the appropriate academic Dean. Leave will be granted only under exceptional circumstances. Recipients of student loans should note that leave of absence constitutes a break in their program of study, resulting in loss of their loan repayment grace period and/or eligibility for student deferment. International students on F1 and J1 visas normally fall out-of-status during the period of a leave and must return to their home country during the leave.

When a student returns from a leave of absence, decisions concerning previous or current program of studies will be mutually agreed upon by the student's Master's Thesis Committee (for MS students) or the Coordinator (for MA students) and the student.

Readmission

"For the record it will be our practice for any graduate student who does not enroll for a semester or more to obtain approval for re-admission from the Dean of the college which administers his or her graduate program, regardless of the student's academic standing." So Sayeth Dr. Tee.

Comprehensive Examination

Master of Arts (MA) in Biotechnology candidates are required to take and pass a comprehensive examination. This must be completed no later than Week 9 of the final semester. Comprehensive exams will include all graduate coursework taken by the student while in the Program. The Faculty member who taught each course (or if he/she is not available, faculty members possessing expertise in that area) will write and grade questions for that topic.

Graduation

The student is responsible for making certain that all requirements have been met and that every deadline is observed.

Each student who plans to graduate is required to submit to the Registrar's Office an Application for Graduation form. This form, supplied by the Registrar's Office, must be submitted before the end of the third week of classes of the academic semester in which graduation is expected (see Section 6 of this Manual). A student turning in the Application for Graduation after the deadline will graduate the following semester. A graduation fee ($130 in AY 2013-2014) must be paid at the time of application. The Application for Graduation must be signed by the academic advisor prior to being submitted to the Registrar's office.

A student denied graduation must complete the requirements for graduation and reapply for graduation. A student must be registered for the semester in which the degree is received.

The University will confer the Master's degree when the following minimum conditions have been met:

Submission of the required application for graduation form

Certification by the Dean that all requirements of the degree being sought have been completed

Achievement of the grade requirements as defined in the University Catalog and by the Program

Satisfactory completion of a thesis, including its acceptance by the WVSU Library (MS degree only)

Successful completion of the comprehensive exam (MA degree only)

No student shall be approved for graduation before the Dean has certified to the Registrar that all academic requirements have been met. The Registrar must promptly notify the candidate and the Dean (or Coordinator) if graduation is not approved for any reason.

Time Limitations

Biotechnology students must complete their degrees within five years from the date of matriculation. Transfer credit must be based on graduate work completed within the five-year period immediately preceding matriculation. Students may apply to revalidate credit taken more than five years prior to matriculation, if course work is relevant to the degree and if approved by the Coordinator and Dean.

Applicants for readmission whose last enrollment in the Program was five or more years prior must have their transcripts re-evaluated by the Coordinator and the Advisor (MS degree). Some courses may need to be repeated or some additional course work required.

Transfer Credit

Students may apply for transfer of a maximum of six (6) graduate credits to be used toward the requirements of the degree. Ordinarily, these transfer credits will satisfy elective requirements only. Transfer credit must be based on graduate work completed within the five-year period immediately preceding matriculation. A petition for Transfer Credit Form (Appendix F) should be filled out by the student and, with an official transcript attached, should be submitted to the Coordinator. Be sure to meet with your advisor to discuss transfer credits and assure that the required courses fit your program of study.

Students requesting a transfer of credit are obligated to make the case for the courses in question. If the requested transfer is for a graduate level course equivalent to one of our own courses, this is usually not an issue and the transfer petition can be handled routinely. If the requested transfer is for a graduate level course not equivalent to one of our own or from a field other than Biotechnology, the student should provide the Coordinator with two things. First is a written rationale for how the course makes an essential contribution to their program of study. Second is a copy of the syllabus of the course in question. Other information may be requested as needed.

6. Timeline and Deadlines for Progress in the Program

Note that summer(s) counts as a semester, whether you take classes in the summer or not.

MS Degree:

In your first semester in the program:

With the help of Ms. Audrana Austin and the Program Coordinator, make sure that all items on the Biotechnology Graduate Program Student Requirement Checklist (Grad Checklist) are completed. This is located in Hamblin 103. Note that each step of your journey through the program requires signatures on the checklist. This form is shown Appendix G.

Get to know the faculty members with whom you might do research for your MS. Ask questions, discuss, and negotiate.

With the consent of the faculty member, commit to a lab in which to do your MS research (i.e., choose a Master's Thesis Advisor) and get the Advisor's signature on your Graduate Student Checklist. Your Checklist is kept in your file in H103.

Take the course "Seminar for Teaching Assistants" (BT 501).

In your second semester:

With the help and approval of your advisor, form a Master's Thesis Committee and get their signatures on your Checklist.

With the help and approval of your Advisor and Committee, establish a Plan of Study and get signatures.

In your third semester:

With the help of your Advisor, write your Master's Thesis Proposal. Submit your completed Proposal to your Committee two weeks prior to meeting with them.

Meet with your Committee, secure their approval of your Proposal, and get signatures.

In the semester before you intend to graduate:

With your advisor, determine when you will graduate. Make sure that you have:

Completed all required coursework (with appropriate GPA), or are currently enrolled (This includes core Biotechnology courses, research credits, and electives.

Gotten all transfer credits and other anomalies on-record with WVSU. Remember, if it's not on your WVSU transcripts, it doesn't exist.

Completed all course deficiencies or other un-fulfilled requirements (You must be un-conditionally enrolled in the program.)

Completed (or are currently competing) two sections of teaching.

In the semester in which you intend to graduate:

You must be an active student (i.e., enrolled for at least 1 credit) in the semester that you graduate.
You must apply for graduation by the date announced in the WVSU Academic Calendar for that year.
You must finish your research.
If your advisor and/or committee so chooses, establish a "**Thesis Writing Plan**" by the **Friday of Week 3**. This is a written agreement between you, your Advisor and your Committee that sets deadlines for writing and completing the thesis.

Write your thesis. Allow plenty of time.
Get approval from your Advisor that the thesis is complete and ready to defend.
Announce / advertise the **public presentation** of your thesis no later than two weeks prior to presentation (by **Friday of Week 12**).
Give completed, ready-to-sign copies of the thesis to your Advisor and Committee. **Schedule your thesis** defense at least one week prior to the defense (by **Monday of Week 13**).
Defend your thesis no later than **Monday of Week 14**.
Make corrections to your thesis to the satisfaction of your Advisor and Committee
Get final approval of your thesis. Have your Advisor and Committee sign (the signature page of) the completed copies of your thesis.
Do a **public presentation** no later than the **Friday of Week 14**.
Give a minimum of three **final copies** of your thesis, ready for binding, to the library no later than **4:00 pm, the Thursday of Week 16** (i.e., three days before commencement).
Upon receipt of three ready-to-bind theses, the library will give you a written Master's Thesis Deposit Receipt. Return it to your Advisor.
The library will return one bound copy to the Biology Department for the Department files.
The Department will pay you for this copy.
Your advisor will officially notify the Coordinator that you have completed all requirements for the MS degree. The advisor forwards a copy of the Master's Thesis Deposit Receipt to the Coordinator.
The Coordinator and Dean will notify the Registrar that all requirements for your graduation are completed. Deadline for the Registrar to receive the letter is **12:00 noon, the Friday of Week 16** (i.e., two days before commencement).
If notified of a problem with your graduation, the Coordinator will notify you immediately.

MA Degree:

In your first semester in the program:

With the help of Ms. Audrana Austin and the Program Coordinator, make sure that all items on the Biotechnology Graduate Program Student Requirement Checklist (Grad Checklist) are completed. This is located in Hamblin 101D. A copy of this form is shown in Appendix G.

As an MA student, your advisor is the Coordinator of the Biotechnology Graduate Program

In the semester before you intend to graduate:

Meet with the Coordinator to verify that you are ready to graduate. Be sure that
- You have completed all required coursework (with appropriate GPA), or are currently enrolled. This includes core Biotechnology courses and electives.
- You have gotten all transfer credits and other anomalies on-record with WVSU. Remember, if it's not on your WVSU transcripts, it doesn't exist.
- You have completed all course deficiencies or other un-fulfilled requirements (you must be un-conditionally enrolled in the program)
- You have completed (or are currently competing) two sections of teaching.

During the semester in which you intend to graduate:

You must be an active student (i.e. enrolled for at least 1 credit) in the semester in which you graduate.
You must apply for graduation as announced in the WVSU Academic Calendar.
You must pass a **Comprehensive Exam**, based on information from, and administered by faculty who teach Biotechnology Core courses. Deadline is by the **end of Week 9**.
The Coordinator and Dean will notify the Registrar that all requirements for your graduation are completed. Deadline is the 5:00 pm, the Wednesday of Week 16.
If notified of a problem with your graduation, the Coordinator will notify you immediately.

7. Safety

At the start of each academic semester, the Biotechnology Graduate Faculty hold an Orientation and Safety Meeting for all Biotechnology Faculty and Graduate Students (old and new). Purposes of the meeting include introduction of Program personnel, orientation as to matters of registration and scheduling, and other administrative topics. However, an important topic covered in these meetings is safety, especially in the laboratories. Attendance is mandatory, and roll is taken. Please understand that safety is paramount in the WVSU Biotechnology Graduate Program.

The College of Natural Sciences and Mathematics has a Safety Committee which coordinates with the campus-wide Safety and Parking Committee. An NSM Safety Manual is currently being prepared. Many safety and emergency protocols are already in place, and will be explained during the Orientation and Safety meeting.

Also refer to safety information linked to the WVSU web page. We encourage all students to enroll in the WARN (Wide Area Rapid Notification) system. This is done through the WVSU web page. The following documents are also linked to the WVSU web page under "Campus Safety":

Emergency Response Guide
Campus Crime
Emergency Response Memo - February, 2010
Emergency Response Guide - Shelter-In-Place Procedures

8. Graduate Student Association

In AY 2007 - 2008, the students of the Biotechnology Graduate Program formed the Graduate Student Association. Through this fully-recognized academic organization, Graduate Students can speak with a stronger voice to address the entire range of issues that affect them. A representative of GSA participates at faculty meetings of the Program. The GSA actively participates in recruitment, informational and public relations activities. An GSA web site is in the offing.

9. Frequently Asked Questions and Updates to the Manual

Students, Faculty and Staff are encouraged to continually update the Graduate Student Manual, root out errors, add new and relevant info, etc.

Must graduate students be full-time to get a GTA or GRA?

Yes

May a grad be full-time with a combination of grad and undergrad courses?

Yes. Any course will count if it is part of the student's approved Plan of Study.

May MCATs substitute for GREs ?

No

May research credits count as MA electives?

A maximum of four (4) credits of Master's Thesis Research (BT 695) may be credited toward the MA degree. The decision to permit this is given by the student's advisor.

For MS students, may Master's Thesis Research credits may be counted as electives?

No

May BT 511 credits count as electives?

Up to two BT 511 courses may count toward graduation, but you may take more BT 511s as free electives.

In order to be eligible for an Evans-Allen Graduate Research Assistantship during the summer, must a student be enrolled in the summer 3 or 6-week session? Must he/she be full-time?

Answer is pending

Are summer Evans-Allen RAs full or part-time?

Part-time if they're also taking classes, full-time if they're not

Do grads get a tuition waiver for summer classes?

Mr. Casto (*circa* 2009) says no summer tuition waivers, period. Something about the angle of the sun.

Will the Program have mandatory lab rotations for new students?

There will be no formal lab rotations. Students in their first semester will be strongly encouraged to shop around for labs, such that they can make a decision (in writing, signed on the Graduate Student Checklist) by the end of the first semester.

What if an MS student wants to change labs?

An MS student may leave his/her lab (i.e., discontinue his/her association with the Master's Thesis Research Advisor). However, if a student leaves his/her Master's Thesis lab, his/her continued support is his/her own concern; the Program is under no obligation to find alternative support. Although the Biotechnology Faculty "make every effort to continue supporting the student for four (4) contiguous semesters", the clock does not start again when a student enters a new lab.

Must students take BT 501?

At the faculty meeting of August 15, 2012, it was agreed by consensus that, although BT 501 will not be officially required, all new students will be strongly prevailed upon to take the course in their first semester, and thereafter as deemed necessary by their teaching performance.

Can grad students who don't get a degree get a Certificate in Biotechnology?

At meeting of April 5, 2013, faculty say "yes", assuming that all requirements of the certificate are met. Students may not receive both a Certificate and a degree.

Do grads get their lab fees covered by their tuition support?

On September 23, 2013, the cashier says "no", they have to pay their own lab fees.

Must GTAs hold office hours?

GTAs must hold one office hour per class they teach. minutes of Aug 17, 2011

Apart from assistantships, are there other grants or scholarships available to Biotech Grad Students?

Yes. For example, the Dr. Ida F. Kramer Endowed Scholarship is often awarded to Biotech Grad Students who are preparing to teach in higher education. Your advisor will be glad to help you find and apply for a host of grants, which will both support your work and theirs. Looks great on your *CV*, too. Watch Hamblin Hall bulletin boards for opportunities.

Is tuition waived / covered for undergraduate courses?

In Spring 2010, Bryce Casto ruled that graduate students may not get tuition waived for undergraduate courses.

May a student who has already taken (for credit) a 3XX course later take the same course at the 500 level (5XX) for credit?

At the March 21, 2014 Biotech Faculty meeting, the answer was "no".

Must an MS student write and follow a "Thesis Writing Plan"?

Before March 21, 2014, the answer was "yes". But at that meeting, this requirement was changed to one that the student's advisor and/or committee may require, if they so choose.

Are Skype interviews required only for international applicants?

No. At the meeting of April 4, Biotech Faculty agreed that all applicants who are unknown to us should do a Skype (or in-person) interview.

Is Advanced Organic Chemistry (Chem 525) an approved graduate elective?

Yes

10. Appendices

Appendix A ..... Application Checklist

_____ Sealed, official transcripts from all post-secondary institutions. We require a minimum GPA of 3.0 on a 4-point scale (both in the natural sciences and over-all GPA). Send this to WVSU Admissions Office, 124 Ferrell Hall. University address: **Box 1000, Institute WV 25112-1000**.

_____ cumulative GPA Also give a GPA in natural sciences, if known: _____

_____ application form (Appendix B) Send to Biology Dep't., 101 Hamblin Hall, WVSU

_____ statement of purpose (Appendix C) Send to Biology Department, 101 Hamblin Hall, WVSU

_____ 1 three letters of professional recommendation (Appendix D) Send to Biology Department, 101 Hamblin Hall, WVSU

_____ 2

_____ 3

_____ GRE score: verbal at least 140, quantitative at least 150 (old system: 950 combined)
University code for WVSU is 5903. Send to Admission Office, 124 Ferrell Hall, WVSU

_____ application fee: $24 for in-state applicants, $34 for out-of-state applicants
checks payable to West Virginia State University (non-refundable)
Send to Biology Department, 101 Hamblin Hall, WVSU

_____ If you are receiving an assistantship, we require a letter of intent. (Appendix E)
Send to Biology Department, 101 Hamblin Hall, WVSU

additional admission requirements for international applicants

_____ evaluation of transcripts by an evaluator such as **www.wes.org** or **www.ece.org**
Send to Admissions Office, 124 Ferrell Hall, WVSU

_____ TOEFL score of at least 80 (old system 550) university code for WVSU is 5903
or Send to Registration + Records, 128 Ferrell Hall
_____ IELTS score of at least 7

_____ We require an affidavit of financial support for at least $10,000. There is no form.
Send to Biology Department, 101 Hamblin Hall, WVSU

_____ proof of immunization in an official document from a physician indicating dates of immunizations for the following (no form). Send to Biology Dep't., 101 Hamblin Hall, WVSU

mumps / measles / rubella (MMR) hepatitis B meningococcal meningitis

_____ We reserve the right to ask for a Skype interview with accompanying authentication of identity.

Appendix B..... Application for Admission

WEST VIRGINIA STATE UNIVERSITY

Return to: Biology Department, BT Grad Program, West Virginia State University
101 Hamblin Hall, P. O. Box 1000, Institute, WV 25112-1000
Phone: (304) 766-3102

Personal Data:

Date of Application		Social Security Number					
Last Name		First Name		MI:			
Preferred First Name		Date of Birth					
Current Address: Street or P. O. Box:							
City:		State:		Zip:		County:	
Home Phone Number:		Business/Other Phone Number:					
Email:		Pager:					
Permanent Address (if different):							
Have you ever been enrolled in school under any other name(s)?	Yes		No				
If so, please provide full name(s):							
Are You a U.S. Citizen?	Yes		No		If not, please indicate immigration status:		
		VISA:					
(Include a copy of both sides of your I-551 Card)							

Name of Parent, Guardian or Spouse: (May be used in case of emergency—optional):

(Last, First, Middle):		Relationship:					
Street or P. O. Box:							
City	State		Zip		County		Country
Home Phone:		Business/Other Phone:					
Email:		Pager:					

Additional Personal Data: (Disclosure of additional personal data is optional and will in no way affect a decision concerning your application.)

Date of Birth:		Birthplace (State):		Male:		Female:	
Ethnic Status:		Have you ever served in the US Armed Forces?		Yes		No	
Will you be applying for veteran's benefits?		Yes		No			

Enrollment Data:

Degree in which you plan to enroll:	MA		MS	
Year you plan to enroll:		Term/Semester you plan to enroll:		
State of Residency:		If resident of WV, how long have you (and /or your parent		
or guardian) lived in WV?	Years		Months	

Student Category:

1.		Post-Baccalaureate Graduate	2.		Transient Graduate

Academic History:
College(s) Attended (Undergraduate):

Name of College/University	City	State	Date of Graduation	Degree	Major

	I plan to take		Took the GRE in	Mo.		Year	
My GRE scores are:	V		Q		**Written Assessment:**		

Have you been suspended or expelled for academic or disciplinary reasons? Yes ☐ No ☐.
If you have, are you currently eligible to return to that institution? Yes ☐ No ☐.

List the three (3) people you are asking to write letters of recommendation. They should be familiar with your educational and/or professional work and be able to evaluate your potential success as a graduate student.

name position address email

1.

2.

3.

//

I certify that all statements in this application are complete and true and I give the aforementioned Institutions permission to use this information for statistical and reporting purposes. I further understand that any willful misrepresentation of information given in this application may be grounds for denial of my admission or dismissal.

signature:_____date:_____

Note: West Virginia State University adheres to the principles of equal opportunity without regard to race, color, gender, age, creed, national origin or disability. This policy extends to all programs and activities supported by the college.

Appendix C..... Statement of Purpose

Your statement should include your purpose in pursuing graduate study, any research you wish to pursue, and your future career goals.

Appendix D..... Letter of Recommendation

February 10, 2014

West Virginia State University
Biotechnology Graduate Program

name of applicant _____

---

to the student applicant:

The Family Privacy Act allows applicants to inspect and review all materials in their files, except for letters of recommendation written prior to January 1, 1975.

Upon its completion and submission, college faculty will utilize this document to evaluate your qualifications to be admitted into the Biotechnology Graduate Program. It may also be used to assist in the selection of Graduate Assistants. Before submitting this form to the person who will be writing your recommendation, be sure to check one of the following statements relative to the confidentiality of your files.

_____ I **DO** wish to waive my right to see this document

_____ I **DO NOT** wish to waive my right to see this document

Signature of applicant, date _____

To the person making this recommendation

The above-named applicant for admission to the Biotechnology Graduate Program has given your name as a reference. The Program would appreciate your cooperation in providing the following information regarding the applicant's qualifications. References should be acquainted with the applicant's academic ability. Please print or type.

What is your name and title/position? _____

What is your institution (name and address) ? _____

_____

How long have you known this applicant, and in what capacity? _____

_____

_____

Using the scale **high, average, low,** or **cannot judge**, rate the applicant's characteristics with respect to the following criteria. Use your own student body and recent graduates as a reference group. If the applicant is an employee, use other employees with similar backgrounds as a reference group.

characteristic	high	average	low	cannot judge
General intelligence	_____	_____	_____	_____
Knowledge of the field	_____	_____	_____	_____
Maturity	_____	_____	_____	_____
Dependability	_____	_____	_____	_____
Work ethic	_____	_____	_____	_____
Research potential	_____	_____	_____	_____
Teaching potential	_____	_____	_____	_____

What is your over-all recommendation for this applicant?

_____ very strong _____ strong _____ average _____ below average

_____ recommend with reservations (please explain below)

On letterhead, please provide additional comments concerning this applicant's strengths and weaknesses. Comments should pertain to the applicant's ability to undertake graduate studies. Be as specific as possible.

When you have completed this form, **either** enclose it in a sealed envelope with your signature across the seal, then give it to the student. The student will then include your recommendation with the completed application portfolio **or** send this recommendation directly to

Biotechnology Graduate Program, Biology Department
101 Hamblin Hall
West Virginia State University
P.O. Box 1000
Institute WV 25112-1000

If you have any questions or comments, please feel free to contact Dr. Richard Ford, Coordinator of the Biotechnology Graduate Program, West Virginia State University, 101D Hamblin Hall, Box 1000, Institute WV 25112-1000 fordri@wvstateu.edu 304-766-5742

We appreciate your time and effort.

Appendix E..... Letter of Intent

We want to know if you agree to accept the assistantship.

The following information constitutes conditions and terms of an offer made to you for the position described below. West Virginia State University uses this information for the purpose of maintaining personnel files. No persons outside the university are routinely provided this information. If you accept this position, your signature is required.

Name:			
(*Last Name*)		*(First Name)*	*(Middle)*
Address:			
Program:	Academic Affairs / Title III	Student SS#	
Responsibilities:	Teaching Laboratory Component of Biology Courses		

(Note: Financial restraints and program changes may result in adjustment in specific responsibilities and/or sources of funds during the period of appointment.)

Length/Date of appointment:		To:	
Fractional time appointment:	.50	Hours per week service:	20
Annual Stipend:	$12,000.00 **per academic year *(not including summer)***		
Position Offered by:	Biotechnology Graduate Program		
(Program)			
		Date:	
(Department Chair/Program Coordinator)			
(Dean of Natural Sciences and Mathematics)		Date:	

Approved by:	Date:	

(Vice President for Academic Affairs/Dean of Land-Grant Programs)

Approved by:	Date:	

(Executive Coordinator)

Note: WVSU required graduate assistants to be enrolled as students.

Are you a citizen or permanent resident of the United States?

	Yes		No	*(If No is checked, you must attach a signed Nonimmigrant Work Understanding.)*

I accept the position described above (Please sign on the line below.)

Signed:						Date:		
After signing, please return this form by:								
To:			Address:					
Copies to:	☐	Student	☐	Department	☐	Academic Dean	☐	Vice President for Academic Affairs

Appendix F.....**Petition for Transfer of Graduate Credits**

West Virginia State University Biotechnology Graduate Program

name: _____ WVSU ID: _____
last first maiden or middle

home address: _____ city: _____

state: _____ zip: _____ country (if not U.S.): _____

e-mail: _____ telephone: _____

concentration: _____ Organismal / Environmental _____ Molecular / Microbial

COURSES REQUESTED TO BE TRANSFERRED TO WVSU:

(1) institution name and location: _____

sem / yr	dept. and number	course title	credits	grade	transfer as: core / elective

remarks:_____

(2) institution name and location: _____

sem / yr	dept. and number	course title	credits	grade	transfer as: core / elective

remarks:_____

petition for transfer: _____
Student's signature date

petition approved and transfer credits recommended by: _____
Advisor's signature date

approved by Coordinator _____
Coordinator's signature date

approved by Graduate Coordinator _____
Graduate Coordinator signature date

Note: Transfer Policy Graduate credit may be transferred from other institutions provided that:
The credit is certified as being graduate-level and is from an accredited graduate institution;
The grade is a B or higher;
The course did not provide credit towards a previous degree already received;
The credit is approved as appropriate to the student's degree program by his/her advisor;
Credit earned in quarter hours should be converted to its semester hour equivalents

6. You provide your Advisor with an official transcript(s) from the institution from which you wish to transfer credits.

Appendix G..... Graduate Student Checklist *form Spring 2014*

---

name _____ MS or MA track _____

application materials

_____ Application for Admission
_____ Statement of Purpose
_____ Letter of Reference 1
_____ Letter of Reference 2
_____ Letter of Reference 3
_____ GRE: verbal 140, quant 150 ..... goes to admissions or Mary Wickiser
_____ application fee: $34 (AY 2013 - 2014)
_____ Letter of Intent

international applicants:

_____ *transcript evaluation ..... goes to admissions?*
_____ *TOEFL or IELTS ..... goes to registrar*
_____ *affidavit of support*
_____ *proof of immunization: MMR, Hep B, meningococcal meningitis*
_____ *Skype interview*

---

semester started in the Program _____

Orientation and Safety Seminar (date) _____

What deficiencies / remediation must the student do, in addition to normal Biotech coursework?

_____

signature of **Faculty Advisor** and date (MS only) _____

signatures of **Thesis Committee (MS)**

_____ _____

_____ _____

graduate coursework MS needs 30 credits, MA needs 36 credits

core courses MS and MA need 12 credits

BT 511	Seminar	1 credit	_____
BT 511	Seminar	1 credit	_____
BT 555	Statistics	3 credits	_____
BT 567	Current Concepts	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____

teaching (MS and MA) All students must have taught at least two sections.

_____ _____

signatures of **Committee approval of Plan of Study** (MS and MA)

_____ _____

_____ _____

Committee signatures of **approval of thesis proposal** (MS)

_____ _____

_____ _____

Committee signatures of **approval of Thesis Writing Plan** (MS)

_____ _____

_____ _____

Committee signatures on **public presentation of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Committee signatures on **oral defense of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Coordinator's signature on **comprehensive examination** (MA) indicate pass or fail

_____

signatures of Advisor, Committee, Coordinator and Dean signature page on **completed thesis** (MS)

thesis delivered to Library (MS) Library issues a Master's Thesis Deposit Receipt. Keep a copy in the file.

Advisor's **letter recommending student for graduation** (MS) Keep a copy in the file.

Coordinator and Dean **letter recommending student for graduation** (MS and MA) Keep a copy in the file.

Biology Lab Manager signature says all **Biology Department keys have been returned**. (MS and MA)

_____

Please leave **contact info** with Ms. Glenna Curry so we can keep in touch after you leave WVSU.

Appendix H..... Evaluation of Graduate Teaching Assistant

The faculty member in charge of the course should, throughout the semester, observe the Graduate Teaching Assistant's work in both the classroom as well as in preparation for their teaching. The faculty member should provide guidance to the GTA as needed during the semester. The faculty member should complete and sign this form during the final two weeks of the semester. The GTA should sign to acknowledge his/her receipt of the form, and may attach a written response to the evaluation. Signed copies will be given to the GTA and the faculty member, and the original will be kept in the GTA's file.

GTA being evaluated _____ faculty member doing the evaluation _____

course, section(s), semester, year _____

date(s) of classroom observation(s) _____

How often did the GTA teach the lab?

____ always ____ usually ____ some ____ rarely ____ never ____ NA / ?

.....

On a scale of 1 (worst) to 5 (best), or ? if unknown, how would you rate the GTA in:

_____ punctuality in starting and ending labs

_____ knowledge of the theory underlying the labs

_____ knowledge of the lab activities

_____ conveying to students the purpose of the lab vis-à-vis the theory

_____ teaching effectiveness

_____ interactions with the students in class

_____ interactions with students outside of class

_____ effectiveness in testing

_____ test preparation (appropriate, fair)

_____ grading (appropriate, fair)

_____ promptness in returning materials to students

_____ keeping appointments made with the students and faculty

_____ maintaining a professional demeanor and attitude

_____ growth / development during the semester

_____ **average score** (excluding NA / ?)

.....

Specifically or generally, what are the GTA's best qualities with respect to his/her job?

Specifically or generally, in what areas should the GTA work to improve?

other remarks, observations, suggestions:

In sum, was the GTA's performance unsatisfactory, satisfactory, or superior?

signature of faculty member in charge of course _____ date _____

signature of GTA _____ date _____

Signature of the GTA does not denote agreement with the comments, only that the GTA has had the opportunity to review this evaluation. The GTA may, if desired, attach a written response to the evaluation which will accompany this evaluation in the GTA's permanent file.

Appendix I..... Renewal / Continuation of Graduate Teaching Assistantship

from the Graduate Student Manual:

"Recipients of Graduate Teaching Assistantships (GTA) are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters. ...

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught. ...

At its meeting of August 19, 2009, the Biotechnology Graduate Faculty decided that Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). .... Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen."

Using appropriate criteria, the Biotechnology Graduate Faculty decide to whom to award GTAs. Normally, GTAs extend for two semesters, and are normally renewed for a total of four consecutive semesters. However, it is the responsibility and prerogative of the Faculty to monitor GTAs in all aspects of their academic performance, and with due process, to terminate any GTA who fails to fulfill the requirements of the GTA.

---

1. student name and A number _____

2. year and semester for which the student seeks renewal of his / her GTA _____

3. In the semester for which the student seeks renewal of his / her GTA, will he / she be a full-time student?

4. Has the student met all requirements and deadlines, this semester and for previous semesters, for progression through the Biotechnology Graduate Program?

5. How well is the GTA performing, so far? Is there any reason why the assistantship should not be renewed? If there is a problem, has the GTA been duly advised of the problem (in writing), and given assistance in correcting the problem? If there's anything negative to report, please attach a detailed written statement.

    A. **reports from the GTA's supervising Faculty in the current semester** Include a formal Evaluation of GTA form (Appendix H) or a WVSU Classroom Observation Report.

    B. **report from the Thesis Advisor (MS students) or Program Coordinator (MA students)**

    C. **report from the Biology General Education Coordinator** (where appropriate)

    D. **report from Biotechnology Graduate Program Coordinator**

    E. **other reports** (ex. Dean of the College of NSM, other Graduate Faculty, Laboratory Manager)

Appendix J..... Graduation Checklist

March 4, 2014

Graduate Coursework MS needs 30 credits, MA needs 36 credits **3.0 GPA**

core courses MS and MA need 12 credits

BT 511	Biotechnology Seminar	1 credit	_____
BT 511	Biotechnology Seminar	1 credit	_____
BT 555	Biostatistics	3 credits	_____
BT 567	Current Concepts in Biotech	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

Electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

Research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____	
BT 695	Master's Thesis Res.	_____	_____	
BT 695	Master's Thesis Res.	_____	_____	**GPA** _____

Teaching (MS and MA) at least two sections _____ _____

Comprehensive Exam (MA only) _____

Deficiencies Rectified _____

Thesis (MS only)

thesis committee formed	_____	thesis presentation passed	_____
proposal approved	_____	thesis defense passed	_____
thesis writing plan approved	_____	thesis accepted by Library	_____

Appendix K..... Graduate Certificate in Biotechnology

Graduate Certificate in Biotechnology
West Virginia State University
Biology Department / Biotechnology Graduate Program *March 18, 2011*

A "Graduate Certificate in Biotechnology" from the West Virginia State University Biotechnology Graduate Program is earned by completing and passing the following courses:

1. Biotechnology Seminar (BT 511) ... taken twice	1 credit each	
2. Biostatistics (BT 555)	3 credits	
3. Current Concepts in Biotechnology (BT 567)	3 credits	
4. Techniques in Biotechnology I (BT 571)	2 credits	
5. Techniques in Biotechnology II (BT 572)	2 credits	12 credits total

A student may count no more than two (2) final grades of "C" toward the certificate, and must have a GPA of 2.5 or better in these 12 credits.

Entrance requirements are: an undergraduate degree in a related field, an undergraduate GPA of at least 3.0 (on a four-point scale), TOEFL scores where appropriate of at least 550 (or at least 79 on the computer test), and approval of the Biotechnology Graduate Faculty. The Biotechnology Graduate Faculty may, under special circumstances, waive any of the other entrance requirements, including course prerequisites.. It is understood that students entering the Graduate Certificate in Biotechnology program have a current knowledge of the fields of Cell Biology / Physiology, Genetics (Classical and Molecular), and Chemistry (at least three semesters of college-level Chemistry).

Course transfers and course substitutions are to be decided by the Biotechnology Graduate Faculty, with the certificate candidate being responsible for providing any supporting documentation. No more than four (4) credits may be transferred from another institution.

This Certificate program will take effect in the Fall 2011 semester. However, students may apply these courses (with acceptable final grades) taken in previous semesters to certificates to be awarded in Fall 2011 or later semesters. All courses to be applied to the Graduate Certificate in Biotechnology must be completed within five (5) years of the semester in which a the student starts the program.

The University will charge no fee for awarding a Graduate Certificate in Biotechnology.

For more information, contact the Coordinator of the Biotechnology Graduate Program

Dr. Richard Ford
101D Hamblin Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-5742 fordri@wvstateu.edu

To apply, contact the Director of Registration and Admissions

Ms. Donna Hunter
127 Ferrell Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-4146 hunterdl@wvstateu.edu

Exhibit H: Evaluation of Graduate Teaching Assistant by Instructor of Record (Form)

The faculty member in charge of the course should, throughout the semester, observe the Graduate Teaching Assistant's work in both the classroom as well as in preparation for their teaching. The faculty member should provide guidance to the GTA as needed during the semester. The faculty member should complete and sign this form during the final two weeks of the semester. The GTA should sign to acknowledge his/her receipt of the form, and may attach a written response to the evaluation. Signed copies will be given to the GTA and the faculty member, and the original will be kept in the GTA's file.

GTA being evaluated _____ faculty member doing the evaluation _____

course, section(s), semester, year _____

date(s) of classroom observation(s) _____

How often did the GTA teach the lab?

____ always ____ usually ____ some ____ rarely ____ never ____ NA / ?

.....

On a scale of 1 (worst) to 5 (best), or ? if unknown, how would you rate the GTA in:

_____ punctuality in starting and ending labs

_____ knowledge of the theory underlying the labs

_____ knowledge of the lab activities

_____ conveying to students the purpose of the lab vis-à-vis the theory

_____ teaching effectiveness

_____ interactions with the students in class

_____ interactions with students outside of class

_____ effectiveness in testing

_____ test preparation (appropriate, fair)

_____ grading (appropriate, fair)

_____ promptness in returning materials to students

_____ keeping appointments made with the students and faculty

_____ maintaining a professional demeanor and attitude

_____ growth / development during the semester

_____ **average score** (excluding NA / ?)

.....

Specifically or generally, what are the GTA's best qualities with respect to his/her job?

Specifically or generally, in what areas should the GTA work to improve?

other remarks, observations, suggestions:

In sum, was the GTA's performance unsatisfactory, satisfactory, or superior?

signature of faculty member in charge of course _____ date _____

signature of GTA _____ date _____

Signature of the GTA does not denote agreement with the comments, only that the GTA has had the opportunity to review this evaluation. The GTA may, if desired, attach a written response to the evaluation which will accompany this evaluation in the GTA's permanent file.

Exhibit I: Evaluation of Graduate Teaching Assistant by Program Coordinator (Example)

Name withheld, Graduate Teaching Assistant

Dr. Richard Ford	Observer
Dr. Jonathan Eya	Lead Instructor of the course
Name withheld	TA team-teaching with Mr. X

Principles of Biology (Biol 101 section 02), lab
February 13, 2013, 2:00 pm, Hamblin Hall room 205
17 students present, 20 students enrolled

The objective of the day's laboratory exercise was to do the Macromolecules Lab from the "Principles of Biology Lab Manual".

Mr. X's methods were to do a traditional pre-lab lecture, supported by a PowerPoint presentation that I think he put together himself. The PowerPoint included both the outline of his talk and simple illustrations. He also referred students to the lab manual.

Mr. X's methods were effective, in that the PowerPoint helped organize the four-part exercise in visual form, and allowed students to see in written form the terms being presented. It probably also helped keep Mr. X organized and on-track.

Mr. X was well-prepared. This was evidenced by his PowerPoint presentation, by the lab materials having been neatly set up around the room, by the absence of confusion in his lecture, and by the fact that he started class exactly on time. I also note that he presented background information of sufficient detail to support the underlying theory and illustrate its relevance, without being so detailed as to confuse or bore the students.

Mr. X did a reasonable job in making the lab experience interesting, understandable, coherent and relevant. I think he did this by understanding the material himself, and then by presenting it to the students in an organized, clear, comfortable manner. He pointed out several examples of where students would experience the differences among macromolecules in their daily lives (ex. the grease on the bottom of a bag of fast food).

There was a notable dearth of questions during the pre-lab lecture. In the first 30 minutes, Mr. X twice asked "Are there any questions?", which is a good start. I recommend that he do that much more often, especially at transitions between topics. I also recommend that he ask probing questions to individual students, by name, as in "So Bobby, what if you dunked a powdered doughnut into Benedicts' Reagent?". Mr. X got no questions from students during his lecture. He did, however, start getting questions from students one-on-one as the lab activity got underway.

Mr. X's communication skills were fine; no problem here. But this does lead me to report that the class seemed strangely subdued. There was no student chatter, which is good, but almost no student-student interaction, which is odd. I saw no smiles the entire time. Of course, different classes have different group personalities. And the "observer effect" may be at work! But I would encourage Mr. X to foster a comfortable learning environment in which to engage students in learning, one in which questions can be asked without hesitation, etc. Another suggestion is that, in order to keep multi-part lab exercises from blurring in students' minds, to make breaks between topics more distinct.

All-in-all, I observed Mr. X doing a fine job in his first semester as a teacher. I encourage him to continue coming to class well-prepared and on top of his game. I believe he'll continue to improve, as do all good teachers throughout their careers.

_____ _____

Observer's signature and date Instructor's signature and date

** Note that the signature merely means that the Instructor has received and reviewed the report. It does not indicate agreement with the report.

Exhibit J: Evaluation of Graduate Teaching Assistant by Program (Form)

from the Graduate Student Manual:

"Recipients of Graduate Teaching Assistantships (GTA) are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters. ...

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught.

At its meeting of August 19, 2009, the Biotechnology Graduate Faculty decided that Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). .... Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen."

Using appropriate criteria, the Biotechnology Graduate Faculty decide to whom to award GTAs. Normally, GTAs extend for two semesters, and are normally renewed for a total of four consecutive semesters. However, it is the responsibility and prerogative of the Faculty to monitor GTAs in all aspects of their academic performance, and with due process, to terminate any GTA who fails to fulfill the requirements of the GTA.

---

1. student name and A number _____

2. year and semester for which the student seeks renewal of his / her GTA _____

3. In the semester for which the student seeks renewal of his / her GTA, will he / she be a full-time student?

4. Has the student met all requirements and deadlines, this semester and for previous semesters, for progression through the Biotechnology Graduate Program?

5. How well is the GTA performing, so far? Is there any reason why the assistantship should not be renewed? If there is a problem, has the GTA been duly advised of the problem (in writing), and given assistance in correcting the problem? If there's anything negative to report, please attach a detailed written statement.

   A. **reports from the GTA's supervising Faculty in the current semester** Include a formal Evaluation of GTA form (Appendix H) or a WVSU Classroom Observation Report.

   B. **report from the Thesis Advisor (MS students) or Program Coordinator (MA students)**

   C. **report from the Biology General Education Coordinator** (where appropriate)

   D. **report from Biotechnology Graduate Program Coordinator**

   E. **other reports** (ex. Dean of the College of NSM, other Graduate Faculty, Laboratory Manager)

Exhibit K: Recommendations from "Seminar for Teaching Assistants, Fall 2012

To improve graduate students' experience

1. Graduate students should be offered health insurance like most other schools offer. The GSA discussed this issue, leaving the precedent of the need to find a company that provides security for students.

2. Better instructions to receiving a fellowship and how to sign up for it. The creation of a blog for the biology department was the suggestion discussed. A blog or web page will allow the dissemination and publication of these and other similar issues. Initiative necessary to actually achieve this goal.

3. Dissemination of upcoming conferences, events and meetings that students can attend. *

4. Assign a grad student to each new coming International student to assist them in setting in moving around, and providing general help for the first few weeks until they can stand on their feet (opening bank account, social security number, driver's license, etc.)* An international student association is being created in the university. Possibly this recommendation can be taken to them.

5. RAs should be allowed to park near the building, parking spaces for students are very limited, and it is common that RAs bring samples in their cars. This issue was discussed extensively in class and made significant progress.

6. There should be some assigned paid jobs for the graduate students during summer. *

7. A higher stipend so more time would be able to be dedicated to studying or research instead of a part time job.

To improve teaching performance

8. A better performance might be achieved if laboratory manuals are provided at the beginning of the school year, instead of going lab by lab. If teaching seminar is going to be at the beginning of the week, and then it will be the student's responsibility to properly prepare the class, therefore, both the student and the leader instructor will have to agree and discussed the laboratory in advance.

9. It should be a requirement that the TA and instructor meet once a week to discuss upcoming labs, past labs or concerns.

10. TAs should be assigned their classes a few weeks before classes begin instead of just one week before. For this, professors with TAs should be organized and prepare along with the assistants and not just handing a book to students who never taught before.

11. Any lab being performed should be able to be completed within the specified lab time without rushing. Previous planning and correction of some labs are important aspects to consider for achieving this objective. And if recommendation 15 is accomplished, this will become an easy target to reach.

12. TAs should be assigned mainly first or second year courses. A graduate TA who is assigned a graduate class will be ineffective or at least TAs should not be assigned to classes that she/he has not completed and has to take, or in classes he/she is actually attending.. Recommendation 17 can complement this one. The presence of two TAs could help to overcome the deficiencies of one or the other.

13. TAs should be able to run the class for a decent amount of time, not for only 10 minutes. Professors should allow a moderate amount of time for the TA to run the class. Leaving only a small amount of lab time or professors taking over a lab can interfere with TAs learning experience.

14. TA should keep the same classes since they already know the labs and what needs changed or how to improve them as well as they would still have their lecture notes from the previous semester. *
    It was argued that the organization of schedules represents an inconvenient for this. However, the possibility of carrying out this recommendation can be evaluated more carefully, as there are many advantages for both, students and instructors.

15. Teaching seminar should be one of the first class to start the week. This is done!

16. There should be more TAs in the intro level biology courses or in classes that require long and complex labs (e.g. anatomy).

Under evaluation.

To improve the program's classes

17. A bioinformatics course, separated from the biotechniques and genetics courses. For achieving this goal internet access should be improved, for some reason, the internet failed several times during the bioinformatics module this semester.

18. More courses concentrated on medical topics or the human body for the students using the program to prepare for medical school. It was argued that the rotation, along with the demand of certain courses is the factors that define what courses are offered.

19. The program should have clearly defined course tracks, e.g. medical biotechnology, industrial biotechnology, agricultural biotechnology, pharmaceutical biotechnology etc., so that every student can specialize in his/her area of interest after the first year. The first year can be used for general/basic courses.

Other recommendations

20. Laptop locks and drawer keys should be provided for graduate offices.

21. More journal access on campus, access to the big science journals and find a way to update science books in the library. It was discussed the possibility of creating a reserve of books for the program courses and journals too, where books would be donated by teachers and students.

22. The university should open a host family forum where interested families can become hosts of international students. *

23. The university should build networks with the companies and other institutions so that the graduate students can rely on those organizations for summer internship.

24. T-shirts for the program participants. The GSA is working on this. *

*** additional recommendations**

Exhibit L: Recommendations from "Seminar for Teaching Assistants", Fall 2013

Shelter In Place Assessment
Dr. Ford
Teaching Seminar
Fall 2013

Background

This project is designed to examine the most important issue concerning the students this semester. While other projects were considered, this issue is the most important one to address. For instance, as a class we had already chosen the issue of health insurance for graduate students in the beginning of the semester. Then, something happened to make the class rethink their choice. It came on Wednesday, October 2, 2013 around 9:00am.

Two students were in the Biology Department Core Lab in Hamblin Hall talking with the Lab Manager, Mandy Bailey. The radio was on in the other room of the Core Lab. At first it sounded like the station was performing a test. The campus was silent. No sirens were heard. It was an ordinary day. The annoying test sound on the radio persisted. Mandy got up to hear the announcement. This was not a test. It was a real shelter in place.

Outside of Hamblin Hall looked like a normal day. The radio completed the announcement. The shelter in place area was extended to West Virginia State University. A brief discussion ensued. “Was that for us?” “Are they right?” “I don’t hear anything?” “Shouldn’t we hear the sirens?” “The radio said it was.” “It is an announcement for it.”

Finally, the two students and the lab manager headed to the designated shelter in place area. Was that the sound of a siren in the distance? Were they imagining hearing the siren now? A class was in session in room 107. As we passed the room, Mike notified the teacher that a shelter in place was called. There was a chlorine leak. The teacher seemed to ignore it. By this time, Jessica called her dad. Had he heard anything? Was there anything on the news about it? No and no. Her dad warned, don’t go downstairs. Chlorine is low to the ground. Go upstairs if you must stay there.

Still Mandy, Mike, and Jessica walked downstairs in the basement toward the shelter in place area. Once there, they joined others already in the Hamblin Hall Auditorium. As time progressed other classes started coming into the room. Other people came in while others walked out. Some people surfed the internet on their phones, texted, or talked on the phone. The noise level increased. While many people were gathered here, there was no direct announced statement of what was going on or what to do. Mandy said it was a chlorine leak. Others seemed to be saying the same thing including Dr. Magan.

The doors were covered with plastic and then held in place with duct tape around the edges. I sat toward the back. Now, I was beginning to rethink my setting in the back of the room. The plastic filled and swayed with air puffing out into the room and then deflating. This process kept repeating. It may have been covered, but it sure was not sealed. People arrived later and later. The doors opened and closed. Finally, they appeared to be taping the main doors. Jessica sent out a quick text or so. Others in South Charleston were sheltering in place. It must be real. Why were they not moving them to a higher room? Not all emergencies require the same response.

She sent a text to Dr. Guetzloff. He is on the West Virginia State University Board of Governors and a Chemistry professor at State. It is what she calls a life insurance plan. In the event of her death from chlorine related complications, it proves she was sheltering in the basement, a chemist was there, and the school was sticking with the designated shelter in place area. “Is not chlorine low to the ground? Why are we not in a higher place like the 3rd floor?” (Her text went forever unanswered.)

She was sure that her parents should be able to get access to her texted messages. In the event of her death, the negligence on the school’s part and a nice body count in the basement is every class action lawyer’s dream. She was sure her parents were far enough away from the site that they would live. She smiled as she sent her text. She knew these areas were for the body count anyway. Her parents would probably get some money. A nice class action lawsuit later for the school, and there would be her life insurance plan.

Introduction:

Thankfully, no one at State was seriously harmed by the events of October 2, 2013, but it did change the emphasis for the semester project for this class. Sheltering in place in the basement is not the best idea for all types of chemical emergencies. There are many different types of chemicals, and many different reasons to have a shelter in place. Shelter in place emergencies are not always chemical related, but time matters. These are not

all the same nor should their response be the same. The background in this paper is what changed the destiny of the project to move from health insurance to shelter in place emergencies.

Several areas definitely could have used improvement. First there was a problem with communication. Had the radio not been on in the Core Lab, those parties may have never known. Secondly, there are certain labs and classrooms in Hamblin Hall that are dead zones to the shelter in place alarm. Anyone in these areas cannot hear the alarm. In a true emergency situation, these individuals might not make it out alive. It is important to remember that for all appearances, things seemed normal outside. The problem lies in that in classrooms or labs, radios are not typically turned on. This reduces one way that the message could be delivered on impending danger and the need to shelter in place.

The school has email and text programs to inform students, but the email was sent out about the emergency after it was over. While I do appreciate the school trying to send out notifications, it does not make the school look professional when the shelter in place email goes out after the shelter in place warning is over. It makes it appear unorganized in the response plan the school has. The shelter in place lasted for about an hour. While it is a good idea to have email and text notification systems for the school in emergencies, these will not solely reach the student population. Some students will not have home access to the internet. More importantly, there are students in a class that do not have access to the internet. (Yes, some have smart phones that are capable of receiving their email, but this is not the case for everyone.) Another issue is that during class students are expected to have their cell phones turned off. While I have set in class where my instructor's or other student's phones ring or beep, I generally keep my phone off if I am in class.

Most every professor I have ever encountered in class have very specific statements in their syllabus that denote the importance of students keeping their cell phones off or on vibrate so as not to disturb the class. (Having taught lab classes, I know from the number of students who glance at their phones, many students likely have their phones on during class.) Still this issue is that if people are in class it is reasonable to assume that they are not receiving updates about the shelter in place.

Please keep the school's warning system that notifies via social media though. Not all students will be in class at any given shelter in place. So, these people will benefit from the email and or updates via twitter. Social media is one way to address the public, but there are still people who don't have twitter, instagram, or facebook. For these individuals affiliated with the school the siren is the best method we presently have on campus to notify them. What about students that are physically disabled such as students who are deaf? This is a question that I have struggled with for a long time.

(Back in 2000 I was a lab assistant in the English Department.) We had a student who was deaf. I took sign language, because of that student. It started when we had a planned emergency drill of shelter in place during his class. I had to make sure everyone was out of the room and lock the door. His classmates heard the siren and left. He sat at the computer. He looked at me. I mouthed the words to him slowly that we had to leave. Finally, I wrote on paper for what seemed like a long time. "We are having a shelter in place drill. We need to leave the room and go to the auditorium." He then nodded and got up to comply with the drill. It bothered me that in the time spent writing what was going on, he could be dead. I took sign language after that so that I could communicate to him as soon as it happened. There was never another shelter in place with his class again. Is there a way to notify the deaf or those that are hard of hearing of pending shelter in place emergencies or drills?

A fast response is the best response. Swift action in emergencies can save lives. While we are trained not to panic, it is important to have prescribed and thought out responses to emergencies. Where is all of the shelter in place locations throughout the campus? They are labeled as designated areas in the buildings, but do we know from building to building?

Now, for the location, should people enter and leave. I don't think so. It is not just a 'hey we are out of class' phenomenon. While it may be treated like it is a joke by some students, it is not. Entering and leaving brings about the potential of contaminated air in a chemical leak. Also, at some point the doors are taped. So entry or re-entry becomes an issue. One additional problem is what can be done to make sure that the ventilation system is not compromised. Taping is not working, if the air coming in pushes out the plastic. This is not safely sealed. It may be duct taped, but it is not a fit seal. Also, what about water, food, and restroom facilities? These are possible reasons that people left the room and then re-entered. I realize that a modern response requires lots of money and time, but it is also a good investment. Proper planning prevents poor performance. Would overcrowding of the room ever be an issue? This could be a possibility considering the amount of students in the building at peak hours in the day. It is our understanding that the freshman BIO 120 class is at around 100 students this semester. Now factor in the other classes going on, the visitors, the staff and faculty, and researchers, and this could be a possible overcrowding situation.

Problem Statement:

The problem is defined as the shelter in place emergency response plan and the implementation of communication and call to action on the emergency response plan for shelter in place as it appears at West Virginia State University.

Comparisons:

For this component, other schools were examined for their shelter in place plan. Marshall University and West Virginia University Institute of Technology in Montgomery, WV were examined. Additionally, WVSU was compared to these other institutions. Of the reviews, Marshall and WVUIT had emergency response materials online. WVSU had an article online talking about a planned shelter in place drill in 2012, and the use of the schools WARN system. The warn system is the system that notifies via email and social media. Marshall's plan looked heavily beaucratic in nature and was difficult to navigate as to how their shelter in place system worked. Due to the Cleary Act, they publish a document every year detailing safety and emergency procedures. One area of interest was their plan from quick action in the event of an emergency to get the school back up and running again. It seemed to be geared in a chain of command, and how to get back to business type format. One interesting point in their document (Annual Security and Fire Safety Report) was their description of each of their buildings and what the buildings were made of. This was then placed into classes based upon what those materials were.

By far the best of the websites was provided by WVUIT. Their emergency response materials were readable and easy to locate. A quick search brought about their documents of shelter in place and every other kind of emergency that could occur (Emergency Response Plan). It starts on page 32 and continues. Page 41-42 have the most pertinent information for shelter in place. It is thoroughly addressed and discusses what will happen and why it occurs. They have designated media areas for discussions with local media and define the local media. They have multiple rooms within a building and do not shelter on the ground floor (only higher).

Recommendations:

It is with pride and humble submission that we, the teaching seminar class of fall 2013, give you the recommendations for the shelter in place.

- <u>Improve Communication</u>

Send out timely emails and texts or twitter feeds immediately announcing the call for a shelter in place – preferably when the county emergency response is notified. Tying these into the county system would incur faster communication of the problem and where the problem is located. Send out communications as above detailing the end of the shelter in place and give any pertinent details such as what was leaked or why the shelter in place occurred.

Make the sirens louder. By increasing the volume of the sound on the sirens, perhaps it could be heard in more areas. Seriously, we cannot hear it in parts of our building.

Place more sirens strategically throughout campus. With the placement of more sirens, it provides better coverage for the siren to be heard throughout campus.

Place a strobe light with the sirens. So that light can be seen along with the sirens on campus. We know that the sirens are mounted atop buildings, but this adds to the importance of what is going on. It also should get people off of the sidewalks and into the appropriate shelter in place area.

Inside buildings, tie the siren outside into a sound system inside. Make the sound emit within the building as well as flash strobe lights. This is tricky as it must not resemble a fire alarm.

- <u>Provide</u>

Provide custom fitted door covers for the doors. Then, tape them. This cuts out the air flow into the room that should not have air flow. Oxygen needs to be available also. Oxygen is flammable, but a sealed room must not run out of oxygen, or you defeat your purpose of sheltering in place to begin with: safety.

Provide food, water, and restroom facilities. Might we recommend a water fountain or bottled water and camping portable toilets with biohazard bags? We have no food recommendations at this time due to possible food allergies. Either way, something simple, or what could be on hand in case anyone in the room is diabetic.

Have emergency supplies. In the event that someone should get sick. Advil, Tylenol, Band-Aids, etc.

- Clarity

Post a clear and concise plan for students to follow for emergencies like a shelter in place plan on the website for all to view. Don't bury the thoughts in technical jargon.

Let students know their rights. This should not have to be stated, but it happened in the last emergency. So, clearly state that no instructor has the right to make students stay in a class for any reason when there is a shelter in place emergency. Period. Your life is more important than a test ever is anyway, even though you may not think so at the time. (No rioting or disrespectful behavior is necessary. Hear a siren? Leave the room. Quietly and politely.) I'm not being mean here, but a dead student is likely going to result in a lawsuit. We already face budget cuts and don't need this.

Clearly provide an online map showing the shelter in place areas for each of the buildings on campus and the different room numbers for shelter in place.

Develop a clear response plan for aid to individuals that may be deaf or hard of hearing. No one should be left alone in a room wondering what is going on. This demographic of the population is a personal worry to me. Would the flashing light and the siren address this inside of the building?

Training is essential. Can there be training on proper and fast response to get students moving to designated areas for shelter in place? Would this be helpful or perceived as a waste of time?

- Examine the Situation

Have a varied emergency response plan based upon what is causing the emergency to begin with. All emergencies are not the same, so don't treat them that way.

Have multiple rooms for shelter in place in different locations of the building. These rooms must be connected via telephone for communications.

Different locations in the same building are used for the type of chemical spilled or the amount of students needing room space to shelter in place.

Record names of all persons in the rooms (everyone) and report out to a main building database, should names and physical number of people need to be accounted for.

Conclusions:

In conclusion, we the students of this teaching seminar class realize that this is not an exhaustive list of possible changes that could happen, but we think these are the best suggestions that we can come up with at this time. We know there is a meeting on campus next week for a discussion on how the shelter in place system can be improved. Through discussions with Dr. Magan, we learned that this committee was established by the President of WVSU, Dr. Brian Hemphill to discuss and review the present protocol. This is a fantastic start.

From Dr. Magan, it is our understanding that these protocols and procedures have not been updated for 10 years. It is clearly time to think of what could be changed for the better in addressing the shelter in place. Some criticism appears to be that the administration does not give the Shelter in Place proper attention. We applaud Dr. Hemphill and the faculty and staff presently for their concern in addressing and reviewing this matter.

Please note that these suggestions we have submitted for review above are clearly issues as we see them. Some of our suggested ways of dealing with them may not be the most feasible or cost effective. We respectfully submit this to you for review. As per the proper flow of information, this document has been submitted to Dr. Richard Ford for review. At present, this document is not meant to be circulated to any other person, official, or campus office unless deemed necessary by Dr. Ford and at his sole discretion.

If at any point this document would be requested for the students to circulate, it would follow proper protocol in its distribution. First to the instructor (Dr. Ford), then to the appropriate chair depending on the request (Dr. Ford if graduate program; Dr. Chatfield if Biology program; and so forth), then to the appropriate dean (Dr. Harper if in the College of Natural Science and Mathematics).

We welcome any discussion involving comments, questions, complaints, or general inquiry in our semester project.

Exhibit M: Questions Asked of Candidates to the Biotechnology Graduate Program During Skype Interviews

January 17, 2015

1. Can you see and hear us?
2. Be notified that we are saving a screen shot of you, for identification purposes.
3. What name shall we call you?
4. What time of day/night is it where you are?
5. Tell us about your educational background.
6. What courses have you taken that have especially prepared you for graduate study in Biotechnology?
7. What research experience do you have (ex. as part of coursework, in a research lab)?
8. What teaching experience do you have (ex. classroom teaching, tutoring, one-on-one lab instruction)?
9. What area(s) of Biotechnology are you interested in?
10. Where do you see yourself in 10 years? That is, what are your professional goals and aspirations?
11. How did you hear about the WVSU Biotechnology Graduate Program?
12. What do you do for fun in your spare time?
13. What questions do you have for us?

Exhibit N: **Graduate Student Checklist** *form Spring 2014*

---

name _____ MS or MA track _____

Application Materials

_____ Application for Admission
_____ Statement of Purpose
_____ Letter of Reference 1
_____ Letter of Reference 2
_____ Letter of Reference 3
_____ GRE: verbal 140, quant 150 ..... goes to admissions or Mary Wickiser
_____ application fee: $34 (AY 2013 - 2014)
_____ Letter of Intent

international applicants:

_____ *transcript evaluation ..... goes to admissions?*
_____ *TOEFL or IELTS ..... goes to registrar*
_____ *affidavit of support*
_____ *proof of immunization: MMR, Hep B, meningococcal meningitis*
_____ *Skype interview*

---

semester started in the Program _____

Orientation and Safety Seminar (date) _____

What deficiencies / remediation must the student do, in addition to normal Biotech coursework?

_____

signature of **Faculty Advisor** and date (MS only) _____

signatures of **Thesis Committee (MS)**

_____ _____

_____ _____

Graduate Coursework MS needs 30 credits, MA needs 36 credits

Core Courses MS and MA need 12 credits

BT 511	Seminar	1 credit	_____
BT 511	Seminar	1 credit	_____
BT 555	Statistics	3 credits	_____
BT 567	Current Concepts	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

Electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

Research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____

Teaching (MS and MA) All students must have taught at least two sections.

_____ _____

signatures of **Committee approval of Plan of Study** (MS and MA)

_____ _____

_____ _____

Committee signatures of **approval of thesis proposal** (MS)

_____ _____

_____ _____

Committee signatures of **approval of Thesis Writing Plan** (MS)

_____ _____

_____ _____

Committee signatures on **public presentation of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Committee signatures on **oral defense of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Coordinator's signature on **comprehensive examination** (MA) indicate pass or fail

_____

signatures of Advisor, Committee, Coordinator and Dean signature page on **completed thesis** (MS)

Thesis delivered to Library (MS) Library issues a Master's Thesis Deposit Receipt. Keep a copy in the file.

Advisor's **letter recommending student for graduation** (MS) Keep a copy in the file.

Coordinator and Dean **letter recommending student for graduation** (MS and MA) Keep a copy in the file.

Biology Lab Manager signature says all **Biology Department keys have been returned**. (MS and MA)

_____

Please leave **contact info** with Ms. Glenna Curry so we can keep in touch after you leave WVSU.

Exhibit O: Graduate Certificate in Biotechnology

A "Graduate Certificate in Biotechnology" from the West Virginia State University Biotechnology Graduate Program is earned by completing and passing the following courses:

1. Biotechnology Seminar (BT 511) ... taken twice	1 credit each	
2. Biostatistics (BT 555)	3 credits	
3. Current Concepts in Biotechnology (BT 567)	3 credits	
4. Techniques in Biotechnology I (BT 571)	2 credits	
5. Techniques in Biotechnology II (BT 572)	2 credits	12 credits total

A student may count no more than two (2) final grades of "C" toward the certificate, and must have a GPA of 2.5 or better in these 12 credits.

Entrance requirements are: an undergraduate degree in a related field, an undergraduate GPA of at least 3.0 (on a four-point scale), TOEFL scores where appropriate of at least 550 (or at least 79 on the computer test), and approval of the Biotechnology Graduate Faculty. The Biotechnology Graduate Faculty may, under special circumstances, waive any of the other entrance requirements, including course prerequisites.. It is understood that students entering the Graduate Certificate in Biotechnology program have a current knowledge of the fields of Cell Biology / Physiology, Genetics (Classical and Molecular), and Chemistry (at least three semesters of college-level Chemistry).

Course transfers and course substitutions are to be decided by the Biotechnology Graduate Faculty, with the certificate candidate being responsible for providing any supporting documentation. No more than four (4) credits may be transferred from another institution.

This Certificate program will take effect in the Fall 2011 semester. However, students may apply these courses (with acceptable final grades) taken in previous semesters to certificates to be awarded in Fall 2011 or later semesters. All courses to be applied to the Graduate Certificate in Biotechnology must be completed within five (5) years of the semester in which a the student starts the program.

The University will charge no fee for awarding a Graduate Certificate in Biotechnology.

For more information, contact the Coordinator of the Biotechnology Graduate Program

Dr. Richard Ford
101D Hamblin Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-5742 fordri@wvstateu.edu

To apply, contact the Director of Registration and Admissions

Ms. Donna Hunter
127 Ferrell Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-4146 hunterdl@wvstateu.edu

Exhibit P: Instructional and Research Facilities Used by Biology Department / Biotechnology Graduate Program

Room	Description	Comments
002	330 sq. ft. conference room; seats 16; LCD projection	Departmental and other meetings; seminars
003	Temporary waste storage facility; fume hood flammable storage	Used by Research, Biology, Chemistry and Physics
005	720 sq. ft. classroom with tables seats 48+; LCD projection	Used by Biology and Chemistry
007	Hamblin Auditorium; seats 140; smart podium	Classes, conferences, campus – wide meetings
020	Biology department storage; -80°C freezers; drying oven	
024	Aquaculture research storage	Dr. Eya
026	Aquaculture research lab:	Dr. Eya
H101	Natural Sciences and Mathematics office suite	Also Biology Department office
H101D	Faculty Office	Rich Ford
102	1184 sq. ft. research lab; fume hood; GC, incubator	Dr. Huber environmental microbiology research
106	240 sq. ft. student computer lab; 5 desktop computers Large table, chairs, couch	Available during regular campus hours for use by any student;
107	Classroom with tables; seats 48+; LCD projection	Used by Biology and Chemistry
126	312 sq. ft. digital microscopy research dry lab; specimen storage and preparation	Dr. Ruhnke tapeworm specimen and microscopy lab
128	Staff Office	Seats 4; technicians, postdocs
130	154 sq. ft. prep lab with 2 autoclaves, EPure water purification system and ice machine	General use for all instructional and research activities
131	Faculty Office	Ms. Fletcher
132	110 sq. ft. dark Room and imaging center	
133	Faculty office	Dr. Collins
134	1008 sq. ft. instructional wet lab; 24 fixed stations; LCD projection; incubators, refrigerator	Microbiology, Genetics, Cell Biology, Biotechnology instruction
135	Faculty Office	Dr. Ruhnke
136	256 sq. ft. wet lab with clean hood; anaerobic hood	Huber and Reddy shared research space
137	Faculty Office	Dr. Eya
138	Graduate student office	Seats 6
139	Faculty Office	Dr. Huber
140	1080 sq. ft. instructional wet lab; six benches with 30 fixed stations	Human A&P instruction
141	Faculty Office	Dr. Reddy
142	Instructional core facility; overflow research lab space for Ruhnke group	Prep for labs
144	282 sq. ft. stock room and academic lab manager's office	Mandy Bailey
145	Research lab; fume hood; mini digesters	Dr. Huber: Environmental Microbiology research
201A	Research lab; digital microscopy	Dr. Collins
201B	171 sq. ft. headhouse	Greenhouse prep
201C	300 sq. ft. greenhouse	Generally used for instruction; some research
202	684 sq. ft. research lab; fume hood	Dr. Chatfield plant physiology research

203	1026 sq. ft. instructional wet lab; 24 fixed stations	Botany, Ecology instruction
205	958 sq. ft. instructional wet lab with tables; seats 24; LCD projection	General Education Biology instruction
207	1062 sq. ft. 959 sq. ft. instructional/research lab; 18 fixed stations; fume hood; clean hood; centrifuge; refrigerator; LCD projection	Biotechnology, Biochemistry instruction
208A	Graduate student office	Seats 2
208B	Post doc and tech office	Seats 2
209	1134 sq. ft. instructional wet lab with tables; seats 30; LCD projection	Introductory Biology Nutrition and service course instruction
211	Faculty Office	Dr. Harper
212	676 sq. ft. classroom with desks; seats 45+; LCD projection	Mostly used by Chemistry; occasionally used by Biology
214	Microscope lab;	Temporary visiting scientist office
216	140 sq. ft. zoology specimen storage wet lab	
218	885 sq. ft. instructional wet lab; 24 fixed stations; LCD projection	Zoology, Evolution instruction
219	Faculty Office	Dr. Chatfield
227	Faculty Office	Dr. Hankins
230	240 sq. ft. research lab; fume hood	Dr. Hankins tumor biology
232	432 sq. ft. research lab; fume hood	Dr. Hankins tumor biology
301	324 sq. ft. research instrument lab	Drs. Padma and Reddy genomics
303	405 sq. ft. shared research lab; fume hood	Drs. Padma and Reddy genomics
305	572 sq. ft. shared research lab; fume hood, clean hood, PCR lab	Drs. Padma, Reddy, Harris and Hankins genomics, muscle physiology
306	Graduate Student Office	Seats 6
309	624 sq. ft. research lab; fume hoods (2)	Dr. Eya metabolomics and fish physiology
330	312 sq. ft. research instrument wet lab; LC, incubator	Dr. Padma and Dr. Reddy genomics

Exhibit Q: Equipment in the Biotechnology Graduate Program

January 17, 2015

1 ABI 3130xl Genetic Analyzer
2 Advance analytical Fragment analyzer
3 Agilent Bio Analyzer 2100
4 Applied Bio systems Step One-plus RT PCR
5 Applied biosystems Thermal cyclers-2720 (7)
6 Belly Dancer shaker
7 Bransonic Sonicator
8 Circulating Water bath
9 DNA Concentrator Labconco
10 Eppendorf Centrifuge -3430
11 Eppendorf Centrifuge 5415 (Small)
12 Eppendorf Centrifuge 5424 (Small)
13 Eppendorf -Centrifuge 5810 (40c)
14 Eppendorf Thermal Cycler
15 Eppendorf Thermostat Plus
16 Fisher Scientific PH meter
17 Flourchem Gel DOC
18 Gel Electrophoresis Units-large(4), medium (4)and mini(10)
19 Hybridization Oven
20 Speed Vac-DNA concentrator
21 Kinamatica Homogenizer
22 Labconco Vaccum Freze Dryer
23 LICOR 4300 DNA Analyzer (2)
24 Licor Odessy
25 Mini centrifuge
26 MicroArray Scanner
27 Mupid Gel Electrophoresis units (4)
28 Nanodrop-1000 Spectrophotometer
29 NanoPure-Water purification system
30 NUAIRE Sterile Work Bench
31 Partec ploidy analyzer
32 Qiagen Tissue Lyser
33 Qivac 96 well vacuum filtration
34 Roche tissue Lyser
35 Speedvac centrifuge
36 Trinean Xpose spectrophotometer (DNA Quantification)
37 Vortex
38 Water bath (3)
39 Waters 1525 Binary HPLC
40 Zeiss bright field microscope
41 Zeiss Epi-fluorescence Microscope
42 Zeiss Stereo Microscope
43 Zeiss working Microscope
44 Freezers -80 (4)
45 Freezers -20 (4)
46 Zeiss Axioskop II with drawing tube and fluorescent capabilities and attached digital imaging system
47 Leica EZ stereoscope with digital imaging system
48 Two BioRad PCR systems in Core Lab
49 ABI Prism 7000 sequence detection system
50 Class II A2 laminar flow safety cabinet
51 Leica DM LS research microscope
52 Olympus IX-71 Inverted Fluorescent Microscope with Regita CCD camera
53 ONO-301D microinjection/micromanipulation workstation

54 Leica DMIL inverted fluorescent microscope
55 Alliance HPLC system with 2998 photodiode array detector
56 Odyssey infrared scanner
57 four carbon dioxide chambers
58 Flexercell FX4000 cell stretch apparatus
59 Flexercell streamer fluid shear stress unit with OsciFlow flow controller
60 BioTek Synergy HT multi-detection microplate reader
61 BioTek Cytation 3 cell imaging multi-mode reader
62 ABI Prism 7500 real-time PCR system
63 Roche 454 Junior next-generation sequencing system
64 Thermo Fisher Arena 60 Automated Discrete Photometric Analyzer System
65 Centrifuges include RC-5B refrigerated centrifuge, Eppendorf 5810R centrifuge with swinging plate/bucket rotor, and micro centrifuge
66 Spectronic Genesis 2 UV/VIS g spectrophotometer with a temperature controlled 8-cell blocks and available enzyme kinetic software
67 Leco Truspec Nitrogen Analyzer
68 Leco AC-350 bomb calorimeter.
69 Instech Fiber Optic Oxygen monitor for mitochondrial respiration measurement
70 Tissue Lyser II with tungsten carbide beads, 96 well 3 mm bead dispenser, and adapter sets
71 three recirculatory systems for aquaculture, each with 12 152-gallon aquaria. each system has a 100-gallon sump, ploygeyser bead filter, UV light filter and heat pump
72 Aquatic Biosystems Jumbo Cartridge de-chlorinator

Exhibit R: Assessment Plan for the Biotechnology Graduate Program, 2012
Master of Science / Master of Arts Combined

Assessment of the Biotechnology Program at WVSU is measured based on five **Program Learning Outcomes** (PLOs) and three of WVSU's Guiding Values (GV):

1. WV-WVSU-BioD 1.1 SCIENTIFIC METHOD: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.

2. WV- WVSU-BioD 2.1 LABORATORY SKILLS: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.

3. WV- WVSU-BioD 3.1 CONTENT: Demonstrate an understanding and proficiency in one of the specialized areas of study: organismal/environmental or molecular/microbial.

4. WV-WVSU-BioD 4.1 SCIENTIFIC ISSUES: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.

5. WV-WVSU-BioD 5.1 COMMUNICATION SKILLS: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. WV-WVSU-GV.1 Academic Excellence

2. WV-WVSU-GV.4 A core of student learning that includes effective communication, understanding and analysis of the interconnections of knowledge, and responsibility for one's own learning.

3. WV -WVSU-GV.6 Development of human capacities for integrity, compassion, and citizenship

An evaluation will be made in three of Biotechnology's core curriculum courses. An early assessment will be made in BT 511, continuing with a middle assessment in BT 567, and a final assessment in BT 572. Data collection of students' performances in these courses concerning final grade, cumulative exams, written and oral presentations, laboratory assignments, comprehensive MA final, and Master Thesis
and public presentation will follow. This system will be implemented fully, rather than phased.

Data concerning lecture and laboratory materials will be combined to determine a final grade. Students will be assessed based on their general understanding of lecture materials through a final grade compiling assignments such as exams, quizzes, and written assignments. This component addresses Biotechnology PLOs three, four, and five. Students will also be assessed based on their laboratory skills including hand-ins, write-ups, quizzes, experimental reports, and independent presentations. This component addresses numbers one, two, and five of the Biotechnology PLOs. Both components cover all three WVSU Guiding Values. Students will receive a score of one through three based on their overall percentage in each component. Exemplary work (100%-90%) will receive a four, acceptable work (89%-80%) a three, and work that is unacceptable according to program requirements (69% and below) a one.

A cumulative exam will be used to assess students on their knowledge of topics presented in lectures throughout Biotechnology courses 511, 567 and 572. This data strongly assesses PLO number three along with the three Guiding Values. Data will be collected via a rubric identical to the one seen in final grade assessment. An additional assessment will be conducted upon completion of a comprehensive Masters of Arts final. This assessment will be made much like the cumulative exam.

All students in BT 511, 567, and 572 will be subject to data collection concerning their ability to write a concise, well-constructed paper and/or their ability to give an audible, informative presentation. Each of these components of the third assessment assignment addresses PLOs two through five including the three WVSU Guiding Values. Assignments will be graded on content knowledge, grammar /spelling, organization, references, and oral presentation skills. Each constituent graded on a scale of one to three, exemplary to not acceptable. An additional assessment will be conducted upon completion of a Masters of Science thesis and public presentation. This assessment will be made much like the written assignment and oral

presentation.

The program's final course assessment is based on the student's skills in BT 572. They are expected to complete a laboratory report that is concise, informative, and knowledgeable using a standard format. This task addresses Biology PLOs one through five and each of the three WVSU Guiding Values. Assignments will be rated one to three on the following: components, procedures, diagrams, content knowledge, spelling/grammar, and references and graded on a 3-point rubric.

Collection of data will be completed via LiveText.com. Each instructor of the evaluated courses has set up a LiveText account and will be able to access assessment rubrics accordingly. Final grades for the Fall 2011 Semester will be submitted and full, comprehensive data will be collected for Spring 2012.

Exhibit S: Assessment Map for the Biotechnology Graduate Program, 2012

course, lab, hours	PLO #	**Assessment 1** Final Grade what, when	**Assessment 2** Cumulative Exam what, when	**Assessment 3** written / oral presents what, when	**Assessment 4** Lab assign what, when
Biotech Seminar BT 511 no lab 1 hour	1, 2, 3 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	NA	final paper oral presentation Week 15	NA
Biostatistics BT 555 no lab 3 hours					
Current Concepts BT 567 no lab 3 hours	1, 2, 3 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	cumulative final Week 16 PLO 3	research proposal oral present PLO 2, 3, 4, 5	NA
BioTechniques I BT 571 lab 2 hours					
BioTechniques II BT 572 lab 2 hours	1, 2, 3, 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	cummulative final Week 16 PLO 3	independent project design PLO 2, 3, 4, 5	lab report data present, analysis, PLO 1, 2, 3, 4, 5
Seminar for TAs BT 501 1 hour					

Exhibit T: Assessment Timeline for the Biotechnology Graduate Program, 2012

YEAR	SEMESTER	COURSE-LEVEL PLOs ASSESSED	TOOLS
Year 1	Spring 2012	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2012	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 2	Spring 2013	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2013	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 3	Spring 2014	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2014	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 4	Spring 2015	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2015	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 5	Spring 2016	Biotech 511	MS Public Presentation

			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2016	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation

Academic Affairs Assessment of Student Learning

Report for Academic Year *2013-2014*

Department/Program Biotechnology MS MA

Program Learning Outcomes Developed in AY 2010-2011 (attached pdf).

1. Scientific Method: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.
2. Laboratory Skills: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.
3. Content: Demonstrate an understanding and proficiency in one of the specialized areas of study: Organismal/Environmental or Molecular/Microbial.
4. Scientific Issues: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.
5. Communication Skills: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. Which learning outcomes did you measure this past year? [Please indicate whether any of these measures were conducted as follow-up to a previous year's issues or in response to Program Review. Be specific.]

The previously developed PLOs for the Biotechnology graduate program were never utilized. Five types of assessment were identified in three courses. Three of the assessment types were based on final grades in the courses. The other two assessments were to evaluate written and/or oral communications of an assignment or the MS thesis. While rubrics were developed for these two assessments, who would undertake this component was not determined.

2. In which course(s) were assessments conducted?

None during academic year 2013-2014.

3. How did you assess the learning outcomes (s)? (i.e., method and tool, e.g., rubrics, national norms, item analysis, sampling, student projects, presentations, exams, etc.)

None during academic year 2013-2014.

4. Who analyzed results and how were they analyzed? (Committee, assessment liaison, department faculty, statistical review vs. benchmark, Live Text, etc.)

None during academic year 2013-2014.

5. Summarize results/findings/conclusions. (Data analysis)

None during academic year 2013-2014.

6. What are next steps? (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)

With guidance from the university, the assessment team for the biotechnology program developed new PLOs in the fall of 2014. This plan was unanimously accepted by the graduate faculty in a motion made at a program meeting September 5, 2014. Plans are being made to create the necessary rubrics that will be presented to the graduate faculty at the next meeting (September 19). We plan to share the rubrics with our students to acquaint them with the faculty expectations of successful graduate students. This new plan will allow us to assess students both early and late in the program, to identify gaps in our program and to allow improvements, changes and additions to improve the program.

Exhibit V: Assessment Plan for the Biotechnology Graduate Program, 2014

Academic Affairs Assessment of Student Learning

Draft Plan for Academic Years 2014-2015 and 2015-2016

Department/Program Biotechnology (MS and MA)

Program Learning Outcomes

1. Demonstrate ability to use the scientific method to address problems germane to the field of biotechnology
2. Demonstrate their ability to communicate professionally with fellow Biotechnologists, in both written and oral form, at a level appropriate for those with a Master's degree in the discipline.

Curriculum Map

	PLO#1 Demonstrate ability to use the scientific method to address problems germane to the field of biotechnology	PLO#2 Demonstrate their ability to communicate professionally with fellow Biotechnologists, in both written and oral form, at a level appropriate for those with a Master's degree in the discipline
BT 567 Current Concepts	X	X
BT 571 Techniques in Biotechnology I		
BT 572 Techniques in Biotechnology II		
BT 555 Biostatistics		
BT 511 Seminar (first time) BT 511 Seminar (second time)	X	X
Thesis (MS)		
Oral Defense (MS)		
Comprehensive Exam (MA)		

1. Outline which learning outcomes and where you expect to conduct measures over the next 2 academic years (falls and springs) Include rationale, e.g., trending data, planned/ongoing follow-up from previous assessments or program review cycle, etc.)

Fall 2014

BT 567 Current Concepts in Biotechnology: PLO#1 and PLO#2 will be measured from the course project of a grant proposal with a rubric for each that will be shared with the students. This is a new measure to assess use of the scientific method and communication skills of all students in the Biotechnology program. BT 567 is offered every fall, so students take it in their first or second semester in the Program.

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Spring 2015

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Fall 2015 Data from the 2014-2015 academic year will be reviewed by the assessment team during the summer of 2015 to evaluate implementation of the new assessment plan, measures used, trends if they can be identified and recommendations for modifications necessary prior to the 2015-2016 academic year. This information will be shared with the graduate faculty and invited parties at one of the first departmental meetings of the new academic year. If no modifications are proposed the following courses will be assessed as listed:

BT 567 Current Concepts in Biotechnology: PLO#1 and PLO#2 will be measured from the course project of a grant proposal with a rubric for each that will be shared with the students. This is a new measure to assess scientific method and communication skills of all students in the Biotechnology program. BT 567 is offered every fall, so students take it in their first or second semester in the Program.

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Spring 2016 Unless recommendation to the assessment plan are proposed in the Fall of 2015, the assessment plan will be as follows:

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be

required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

2. How are you planning to measure the learning outcomes (s)? (What object, i.e., test, project, presentation, etc., and with what tool, e.g., rubrics, item analysis, sampling, benchmarks, national norms, exams, juried review, etc.)

Objects to be used in measuring the PLOs are projects including use of the scientific method and communication skill components. The object in BT 567 will be a grant proposal, written and presented orally in class. The object in BT 511 will be a project in which students (in written and oral form) investigate a current problem in Biotechnology, design proposals to address it, and discuss/defend their ideas. Tools will be rubrics to measure student projects. This assessment plan may also change after the first year of implementation if insights are gained that support changes.

3. Who will be responsible for the analysis and how will results be analyzed? When will results be available?

All graduate faculty are expected to be engaged in understanding and participating in this assessment plan which was unanimously approved on September 5, 2014 in a departmental meeting. The assessment team including the Program Coordinator has specific responsibilities to implement this plan and will lead the collection and analysis of data with graduate faculty colleagues and invited participants to be involved as requested. The assessment team will meet in January 2015 (and each January thereafter) to verify collection of all data from the fall semester and put measures into place to collect the spring term data. Data will be analyzed for the year after the spring term when all the data are available. A summary including any trends and recommendations will be presented in a faculty meeting early in the fall term. Modifications to the assessment plan, based on assessment data and analysis by the assessment team and other faculty, will be recorded in minutes of departmental meetings.

Exhibit W: Committee on Expectations, Standards and Assessment Members, Spring 2011

February 7, 2011

Ms. Belinda Barker
BFOX@kcs.kana.k12.wv.us

undergraduate student representative (name withheld)

Dr. Bonnie Dean, Committee Chair
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304-766-3126
deanbo@wvstateu.edu

Dr. Richard Ford *ex officio* as Chair of the Biology Department
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Marshall University, Huntington WV 25755

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Douglas Wood
Environmental Resources Specialist 3
WVDEP
304-926-0499 ex. 1091
Douglas.M.Wood@wv.gov

Exhibit X: Committee on Expectations, Standards and Assessment
Overview of Plans, Activities, and Results

January 4, 2015

recommendation / plan	**status / result**
CESA evaluates Biology and BT	curriculum, facilities, equipment (etc.) discussed student advising was thoroughly reviewed
CESA active in assessment	never really took off
by helping develop and analyze exit exams	discussed but not done
by developing employer and alumni surveys	discussed but not done
employer / alum survey (on-line, ongoing)	no
undergraduate internship course	yes
NSM Alumni award	no
get database for regional secondary schools	no
activities to include alumni	a few done: invite to semesterly luncheons notify of public seminars
testimonials by alums	no
join WV Bio	no
improve public relations presence	
make advertising posters	no
make promotional videos	filmed, but never released by WVSU
improve web page, do a Facebook page	yes
Science Bowl	yes, done by Dr. Micheal Fultz, WVSU Chemistry Department
summer institute (health science focus)	no
collaboration map	no
Lab Menu	yes

Exhibit Y: Collaborators Beyond the WVSU Biotechnology Graduate Program

January 16, 2015

name	home institution	dates
Nagamani Balagurusumy	Universidad Autonoma de Coahuila, Mexico	
Eric Blough	Marshall University	March 2006 - March 2011
James Denvir	Marshall University	
Phillipe Georgel	Marshall University	
O.S. Isikhuemhen	NC Ag and Tech State Univ.	Sept 2006 - May 2008
Elizabeth Murray	Marshall University	Jan 2009 - May 2010
Ramona Neal	MATRIC	Sept 2006 - May 2008
Maiyon Park	Marshall University	Aug. 2009 - Aug. 2012
Dave Perera	WVSU	August 2013 - present
Gary Rankin	Marshall University	Jan 2006 - Dec 2008
Teodoro Espinosa-Solares	Chapingo Autonomous University, Mexico	Aug 2009 - present
Sridihar Malkaram	WVSU Douglass	
N. Nurul Islam-Faridi	Texas A&M	
Venu Perla	WVSU Douglass	Aug 2014 - Aug 2015
Kevin Rice	Marshall University	Nov. 2010 - Nov. 2013
Florian Reyda	SUNY Oneonta	Sept. 2014 - Aug. 2017
Yan Tomason	Dnipropetrovsk State Agrarian Univ., Ukraine	
Travis Salisbury	Marshall University	Aug. 2009 - Aug. 2012
Kirsten Jensen	University of Kansas	Aug. 2009 - present
Janine Caira	University of Connecticut	Aug. 2009 - present
Doolarie Singh-Knights	WVU	
John Porter	WVU	
Lewis Jett	WVU	
Mafuz Rahman	WVU	
Rakesh Chandran		
Neil Anderson	University of Minnesota	
Siddhartha Dasgupta	Kentucky State University	
David Francis	The Ohio State University	
David Douches	Michigan State University	
Martha Mutschler	Cornell University	
Latchumi Kanthan Bharathi	Indian Institute of Horticultural Research (IIHR)	Sep 15, 2013-Dec 14, 2013
Ramajayam Devarajan	Indian Institute of Oil Palm Research	
Nripendra Singh	National Research Centre on Pomegranate, India	
K. Eraivan Arutkani Aiyanathan	Tamilnadu Agricultural University	

Agenda Item 8.a.ii. **Action**
June 18, 2015

Program Review – Biotechnology, M.S.

PROGRAM REVIEW Committee
Committee Recommendation Form

2014-15

Program: Master of Science in Biotechnology **Date:** February 6, 2015

Type of Review: X Comprehensive Self-Study
Follow-Up / Progress Report

Recommendation to the Board of Governors:

x **1.** Continuation of the program at the current level of activity with specific action as described in the Rationale section of this Form;

2. Continuation of the program at a reduced level of activity (e.g., reducing the range of optional tracks, merging programs, etc.) or other corrective action as described in the Rationale section;

3. Identification of the program for further development (e.g., providing additional institutional commitment);

4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;

5. Discontinuance of the Program according the provisions of Higher Education Policy Commission (Section 8.1, Series 11, Title 133)

6. Other. Specify.

Rationale for Recommendation:

The Program Review Committee recommends the Master of Science in Biotechnology be continued at the current level of activity.

The program has a number of strengths. It has produced a consistent number of graduates, most of whom (85%) are employed, or pursuing further graduate study, in related science fields. The program has received steady financial support from research grants to faculty and a STEM-fields masters grant from U.S. Department of Education. Biotechnology faculty members demonstrate commitment to research and other professional developments activities. In addition to the research activities central to the curriculum, the program also offers graduate students opportunities to teach undergraduates, primarily in lab sections. All the above makes the program unique among others in the region.

The program has a few weaknesses, one of which is the absence of a useful assessment program that generates essential data for analysis and program improvement. It also lacks access to adequate number of full-text academic journals from the library.

Planning for best use of resources would be enhanced with better, more transparent information on potential funding from lab fees and "indirect" funds from grants.

The Committee recommends a formal Follow-Up/Progress Report on program assessment, including data, and on program resources, due December 1, 2017.

Place a check if additional sheet(s) attached ☐

Signature of Committee Chairperson

_____

West Virginia State University

Comprehensive Program Review

for

Master of Science in Biotechnology

submitted to

The Program Review Committee

Summer 2009 through Spring 2014

Table of Contents

III. Viability

IV. Necessity

Appendices

Exhibits

I: Program Description

A. Program Purpose Statement

The purpose of the West Virginia State University (WVSU) Biotechnology (BT) Graduate Program is to provide cross-disciplinary education and training in twenty-first century concepts and biotechniques to a diverse group of regional, national, and international students. The BT Program prepares a cadre of professionals for careers in the diverse industries being revolutionized by Biotechnology and prepares its graduates for advanced education. Through coursework, laboratory work, and other academic experiences such as internships, students advance their critical thinking skills, and master the technical skills necessary to solve complex biological problems.

The Master of Science (MS) degree offered in the BT Program differs from the Master of Arts (MA) degree in that the MS requires a thesis (research, writing, defense, and public presentation), and only 24 credits of graduate electives are required.

B. Program Outcomes

Program Objectives

The goal of the Biotechnology Graduate Program is to provide instruction in the broad field of Biotechnology, as well as specialized training in the current concepts and technological advances of a sub-discipline of Biotechnology. The BT Program prepares students for diverse careers in the Biotechnology, Pharmaceutical, Environmental Sciences, and Health Care industries, as well as Education.

C. Consistency with University Mission

This Program Review addresses the WVSU Mission Statement as it existed during most of the review period.

The crux of the WVSU Mission was: "The University, a living laboratory of human relations, is a community of students, staff, and faculty committed to academic growth, service, and preservation of the racial and cultural diversity of the institution. Our mission is to meet higher education and economic development needs of the state and region through innovative teaching and applied research." The Biotechnology Program is fully consistent with this mission, and highlights the fulfillment of both its letter and its spirit. See Exhibit A, Mission Statement, Biotechnology Graduate Program.

The BT program at WVSU is among the most diverse programs on campus. For example, out of the 52 MS students who were (or are) enrolled in the BT Program during the period of this review, 28 were US citizens and 24 were international students. The internationals came from India, Nepal, Mexico, Jamaica, Bangladesh, Iran, and Nigeria. There were 31 males and 21 females. All were in their twenties to early thirties. Of the U.S. citizens, eight were African-American or mixed race.

The program also meets higher education and economic development needs of the state and the region. For instance, of the 28 MS students enrolled during the period of this review who graduated with their MS degrees, nine are currently enrolled in doctoral programs or professional schools, and 14 have jobs in science. Ten are still in West Virginia. This is evidence which supports the assertion that the WVSU BT Program, MS degree, is meeting educational and economic needs. See Exhibit B, Biotechnology Graduate Students.

As evident from the Faculty Data Sheets, our faculty members are innovative teachers and applied researchers. Coursework is tailored to be applicable to the up-to-date laboratory techniques used in the Program, and students' extensive hands-on learning experiences are as innovative as the techniques themselves. The expertise of WVSU BT Faculty is supplemented by collaborations with Affiliate Faculty from around the region and guest researchers from around the world. Students learn, do, and teach, providing a critical mass of knowledge and mutual support across the BT Program. One of the features of the WVSU BT program is that many of our students publish articles in research journals. See Exhibit C, publications from the Biotechnology Graduate Program. The $9.5 million in externally-funded grants speaks for itself (see Exhibit D, grants awarded to Faculty

of the Biotechnology Graduate Program). This record speaks to the vitality, collegiality, and productivity, and demonstrates by its success in living the mission of WVSU.

The program has more than doubled the number of graduates during this period. During the previous five-year Program Review, 13 students earned MS degrees. In this five-year period, there were 28.

D. Previous Reviews and Corrective Actions

The Biotechnology Graduate Program was reviewed in 2009. See Exhibit E for response from the 2009 Program Review of the Biotechnology Graduate Program. The committee recommended the BT program be continued at the current level with specific action.

There were three areas to improve from the previous program review: 1. lack of program assessment, 2. insufficient space for further growth, and 3. insufficient administrative support.

A Plan of Correction was prepared by the BT Program to address the deficiency that the BT Program could do about: the lack of a proper assessment regimen. The Plan of Correction is delineated in Exhibit F, The BT Program's assessment for the period of this review is covered below in Appendix II-C, Assessment.

E. Accreditation Information

1. Accreditation Organization

The Biology Department, as part of WVSU, is accredited through the Higher Learning Commission of the North Central Association of Colleges and Schools. The BT Graduate Program does not have programmatic accreditation.

2. Year of Accreditation

NA

3. Accreditation Status

NA

4. Accreditation Organization Report

NA

5. Deficiencies and Corrective Actions

NA, but see Appendix II-C, Assessment, below.

Section II: Adequacy

A. Curriculum

Appendix II-A lists the BT Graduate Program's course curriculum. The Biotechnology Graduate Student Manual (Exhibit G) addresses BT Program curriculum in greater detail. The manual is updated every academic year. It contains curriculum, policies, procedures, forms, explanations, FAQs, etc.

The MS degree requires five core courses totaling 12 credits of major requirements, 12 credits of electives, and six credits of Master's Thesis Research.

We divide Biotechnology into two concentrations: Organismal / Environmental Biotechnology, and Molecular / Microbial Biotechnology. We offer electives for both concentrations every semester. The student, with his/her committee, defines a formal "Plan of Study" to help each student get the electives he/she desires.

The central, most significant element of the MS education is the thesis that consists of the research, the writing, the defense, and the public presentation.

During the period of this review, the BT Program curriculum has served the students well. It continues to be an effective format for students to learn Biotechnology. Our catalog is up-to-date, in that every course listed in the catalog has been offered on a course rotation schedule, shared on our web site (and posted in Hamblin Hall), to which we have held faithfully from Fall 2010 to present. Faculty continue to update course content as the field moves rapidly on. In addition to the formal assessment of the program, faculty members conduct informal assessment of their courses each semester.

B. Faculty

Faculty Data Sheets for everyone who taught in the BT Graduate Program during the period of this report are in Appendix II-B. Note that the Biology Department during this review period had thirteen members. Out of those thirteen faculty members, eleven have taught in the BT program. All BT faculty held doctorate degrees in fields directly applicable to Biotechnology with the farthest afield being an Organic Chemist (WVSU Chemistry Department, tenure-track) who taught one section of Spectroscopy. Of the Eleven, nine held tenure at WVSU during the period of this report. All of the BT faculty members also taught undergraduate courses. Typical teaching load for Graduate Faculty is nine credit hours.

The BT Program is administered by a Program Coordinator, who was also the Chair of the Biology Department until Fall 2011. The Chair is given one third teaching release time, and the BT Program Coordinator has none.

The BT Program Coordinator reports to the Dean of the College of Natural Science and Mathematics (CNSM).

In sum, the BT Program has no additional administrative support beyond what is already in place to run the Biology Department or the CNSM.

Graduate Teaching Assistants

Graduate Teaching Assistants are addressed here because they teach as part of their education. All BT students are required to teach at least two sections at some point in their stay.

Each semester of this review period, the BT Program had eight to ten Graduate Teaching Assistants (GTAs) These GTAs teach three sections of the lab components of courses, mostly General Education or lower-level Biology courses.

Our GTAs are supervised by the Instructor of Record, who is to file a formal observation report each semester. The Program Coordinator informally observes regularly, and formally observes all new GTAs in their first semester of teaching, and as warranted thereafter. In BT Graduate Faculty meetings, we evaluate a GTA's performance in a semester to judge if there is any issue that would affect the decision to renew that person's GTA for the next semester. Exhibits H, I, and J contain the forms used for these assessments and an example assessment.

Practically all new graduate students are supported on GTAs in their first semester. New students are strongly encouraged to take the elective "Seminar for Teaching Assistants (BT 501)." Students being enrolled in this course allow the teacher (usually the BT coordinator) to get to know, mentor, and keep tabs on new students. In several semester, this course was also used as a platform for students to evaluate (and recommend improvements to) the BT Program. See Exhibit K, recommendations from "Seminar for Teaching Assistants," Fall 2012; Exhibit L, recommendations from "Seminar for Teaching Assistants," Fall 2013.

Graduate Teaching Assistants are not evaluated using the campus-wide Faculty Evaluation instrument. However, many GTAs take it upon themselves to conduct such evaluations. As these are not University-approved surveys, they are not entered into the students' files or otherwise used by the Program. But our GTAs benefit from them, and it speaks well of their professionalism that they seek out their own students' feedback.

Biotechnology Staff

Although the BT Program has no exclusive support staff, we share staff as part of the College of NSM.

Academic Program Associate (CNSM) Ms. Audrana Austin handles financial matters. She also covers much of the clerical work involved in applications to the program, and maintains students' files.

An Assistant to the Dean of the CNSM position was created from Title III, Research and Development (R&D) money, and was funded in the three academic years from Fall 2011 through Spring 2014. Ms. Leah Turner held the position in the first two years, and Ms. Allison Meadows in the last. Perhaps 25 percent of this person's time was devoted to the BT Program, doing outreach, Program assessment support, supporting Ms. Austin with applications, and informally advising BT students. The position was canceled for financial reasons.

Biology Department Academic Lab Manager Ms. Mandy Bailey does some of the set-up work for BT teaching labs. Some semesters, she also informally supervises a few GTAs who help set up undergraduate labs.

C. Students

1. Entrance Standards and 2. Entrance Abilities

The entrance standards of the Biotechnology Graduate Program are a direct gauge of the abilities we expect of incoming students. Students must enter the program with a good deal of preparation in the natural sciences. Biotechnology requires a broad content background in biology, chemistry, applied mathematics and physics, as well as the ability to conduct scientific work (the Scientific Method) and communicate it at levels of clarity and sophistication necessary to participate in the world of science.

The BT Program requires that incoming students have a baccalaureate degree in a field related to Biotechnology, with a GPA of at least 3.0 (on a 4-point scale) both over-all and in the natural sciences. Because international applicants often come from institutions that do not precisely conform to this model, we require that their post-secondary transcripts be evaluated by an independent agency (such as World Educational Services) and certified to be the equivalent of these requirements.

Applicants must have GRE scores of at least 140 verbal and 150 quantitative. For all international applicants, we evaluate English language proficiency by requiring TOEFL scores of at least 80 or IELTS scores of at least 7. We follow this up with Skype interviews, evaluated subjectively by several BT faculty, staff, and occasionally graduate students. Exhibit M shows the questions we ask during Skype interviews.

Almost all applicants need financial support to attend graduate school. Therefore, although we may accept applicants into the program without graduate assistantships, in practice we make both decisions as one. That is, we only accept applicants if they are acceptable as GTAs. This especially drives our decisions with respect to English language proficiency. As the program has matured, we have gotten ever-more stringent in this.

As the BT faculty evaluate applications, we select for applicants who have done well in coursework areas that provide the foundation for success in Biotechnology, especially chemistry, genetics, and cell biology. We prefer applicants who have research experience, but we frequently accept students whose research backgrounds are inadequate. This is especially prevalent among international applicants, as modern Science research is expensive and beyond the means of their undergraduate institutions.

Each semester, as the Biotechnology faculty select the best applicants from the pool. Occasionally, we accept applicants who do not quite meet the above requirements. We are informed by applicant's references, perhaps a special skill the applicant would bring, or some compelling personal story. Although we would make acceptance

decisions based on majority vote of Biotechnology Core faculty, in practice we have always hammered out consensus decisions. Details of the applications, our ranking thereof and our final decisions are available in the minutes of Biotechnology faculty meetings and application files kept in the offices of Academic Program Associate Ms. Audrana Austin and Program Coordinator Dr. Richard Ford.

3. Exit Abilities

Abilities essential across the field of Biotechnology are learned in the core Biotechnology curriculum. These abilities are measured by student performance in these courses. Appendix II-A shows the Biotechnology Program curriculum. In the required 12 credits of core courses, the Biotechnology Graduate Program ensures that our students learn the theory and skills that our graduates will need in any Biotechnology situation. Specific student outcomes given in syllabi of these courses, available in the Biology main office (Hamblin Hall 101)

By requiring 12 credits of approved elective courses, we provide deeper learning in sub-disciplines / specialties of Biotechnology. The program has two concentrations: Organismal/ Environmental and Molecular / Microbial. See Appendix II-A program curriculum. We recognize that the field of Biotechnology (and students' interests) does not divide neatly into these two (or any) sub-disciplines. In helping students choose elective courses that will help them graduate with abilities most beneficial to their chosen careers, the Biotechnology program uses a "strong committee" model. In a student's second semester, the student and his/her committee prepare a formal "Plan of Study." As the student should stay at in the program for only about two years, and as elective courses are not offered every semester, this plan ensures that course scheduling decisions are made proactively. In addition, in the Plan of Study the committee may authorize that a valuable but non-program course be counted as a graduate elective for their student.

Another six credits of Master's Thesis Research (BT695) are required for the MS degree.

For the MS degree, a thesis proposal, thesis research, a thesis, a thesis defense, and a public presentation are also required. Records of all of these are available in the Biology office. Exhibit N is the Graduate Student Checklist, which is used to keep track of the progress of students through the program.

4. Graduates

Another measure of the BT Program's success is the rate at which our graduates move to the next step in their careers, either a job in the field or graduate/professional school. Exhibit B lists the status of the 52 MS degree-seeking students who were enrolled at any time during the period of this review. Of these 52, 12 are still enrolled. Of the 40 who left the program, 27 graduated: a 68 percent graduation rate. Of the 27 graduates, 14 (52 percent) got jobs related Biotechnology. Another nine (33 percent) are in doctoral programs or professional schools related to the field. Among the MS graduates, that's an 85 percent success rate in the field. Another three (11 percent) took non-science jobs. The status of two more (7 percent) graduates is unknown.

Whether students complete or not, many (particularly U.S.) students entered the program as preparation for medical or dental school. So if a student gets an early medical school offer, he/she may see no reason to delay entry by staying at WVSU. That may look like a failure for the program (in a lower graduation rate), but it's a positive for the student, one likely made possible by the program.

D. Resources

1. Financial

A proportion of money from lab fees (undergraduate and graduate combined) was used to fund graduate education. Biotechnology research is expensive in terms of equipment (see below) and consumable supplies. When the BT Program was created, we were adamant that the program not be a burden on the Biology undergraduate program. See Section II G, Program Weaknesses, below.
In each semester of this review period, we had 14-19 MS students in the BT Program. Almost all were supported by Graduate Assistantships. Graduate Assistantships include a stipend of $12,000 per two semesters and full tuition support. Graduate Teaching Assistantship stipends were covered by funding from the HBCU Master's

grant. Graduate Research Assistantship stipends (and other educational / research needs) were funded by USDA Evans Allen formula funds and/or by grants written by BT faculty. All tuitions were covered by HBCU Master's grant funds. Records are available through Ms. Austin.

2. Facilities

The Biotechnology Graduate Program is located in Hamblin Hall. A few research labs have space either at the Douglass Institute on campus or at other locations in the Kanawha Valley. The Program shares all space and equipment with its parent administrative unit, the WVSU Biology Department. Nothing is dedicated to the one nor restricted from the other.

Space

The Biotechnology Program is housed in Hamblin Hall, which it shares with Computer Services, the Physics Department, the Chemistry Department, the Biology Department, the Douglass Institute, and College of NSM offices. The original building was completed in 1952. Renovations and an addition were completed in 1989. The Program has a relatively small footprint in terms of lecture classroom space. The main difference between the rooms it uses versus those that the Biology Department uses is that the graduate courses don't use Hamblin Auditorium or H107 for course-related purposes. It shares classroom space with the Biology Department, and Chemistry Department in H002 (Hamblin Hall conference room) and H005. The Program uses H002, H134, H140, H203, H205, H209, H218 for lectures. It uses H134, H140, H203, H205, H209, H218 for teaching labs. Everyone in Hamblin Hall shares the computer lab and common areas. Details of the footprint of the Biotechnology Graduate Program in Hamblin Hall are available upon request.

The only additional space used exclusively by the BT Program is the desk/office space assigned to graduate students. We give preference to Graduate Teaching Assistants because they need a place to meet their students. Any remaining space goes to Graduate Research Assistants for whom their advisors can't find room in their labs. To date, we've always found a desk for all students, although conditions have often been tight.

The BT Program has increased its footprint only by making increasingly better use of existing space. The ability of the Program to grow its MS enrollment is pretty much at its limit. Exhibit P shows instructional and research facilities used by the Biology Department / Biotechnology Graduate Program.

Equipment

The BT Program has access to a lot of equipment, most of it quite up-to-date, sophisticated, and expensive. Exhibit Q is a rough list of equipment in the Biology Department / Biotechnology Graduate Program.

The BT Program shares its equipment with the rest of the CNSM, especially the Biology Department. Most equipment was purchased by grants written by individual BT faculty members, who (understandably) supervise their use. The BT Program is proud of the extent to which our students (and undergraduates, too) actually use the equipment; it's not kept "safe" from student use. Personnel from other institutions (scientists and students) remark on this.

Equipment maintenance and service agreements for up-keep remain issues, as funding for these purposes is not always provided for.

The BT Program has a very good arsenal of equipment with which to do (and train students to do) up-to-date Biotechnology. Fortunately, our outstandingly productive BT faculty continually work to update and upgrade equipment for the program.

E. Assessment (Student and Program Levels)

During the period of this review, the BT Program had two formal assessment plans. One was set up as part of the Plan of Correction from the previous program review; see Exhibit F, Plan of Correction resulting from the 2009 Program Review of the Biotechnology Graduate Program. Appendix II-C shows the 2009 assessment plan.

The other plan, implemented in 2012 after being advised to abandon the 2009 plan, was a significant re-working of the BT Program's assessment plan. Exhibit R shows the assessment plan (including Program Learning Outcomes) for the Biotechnology Graduate Program, 2012. Exhibit S shows the assessment map for the Biotechnology Graduate Program, 2012. Exhibit T shows the assessment timeline for the Biotechnology Graduate Program, 2012.

1. Student Outcome Assessment Plan

In the 2012 plan, there were five Program Learning Outcomes:

> Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics;
>
> Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline;
>
> Demonstrate an understanding and proficiency in one of the specialized areas of study: organismal/environmental or molecular/microbial;
>
> Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them; and
>
> Demonstrate the ability to effectively communicate verbally and in writing to the intended audience;

As well as three WVSU Guiding Values:

> WVSU GV 1: Academic Excellence
>
> WVSU GV 2: A core of student learning that includes effective communication, understanding and analysis of the interconnections of knowledge, and responsibility for one's own learning
>
> WVSU GV 3: Development of human capacities for integrity, compassion, and citizenship.

The curriculum map (Exhibit S) indicates which specific objectives were to be assessed and where in the curriculum that would occur. The timeline for administering these assessment instruments is best described graphically, as in Exhibit T.

Assessment instruments for the 2012 plan were things BT students were already doing as graded assignments in core BT courses (written lab report, independent project design, written grant proposal, oral presentations, final papers) and already doing as part of their MS thesis work (written research proposal, public oral presentation of thesis). Assessment instruments that were embedded in courses were assessed by the instructors of those courses, scored as course assignments (but not as per the assessment plan) and reported only to the Registrar as part of the final course grade. Assessments of instruments embedded in thesis work were done by the students' thesis advisors and their thesis committees, were scored pass/fail, and were recorded only as the student being recommended (or not) for a diploma. These assessments were not otherwise scored, and data was not collected by the BT Program for formal program assessment purposes.

Additional assessment instruments included formal teaching evaluations.

2. Use of Assessment Data

This is where the BT Program assessment plans (2009 and 2012) broke down. No one collected assessment data from the individual BT Program faculty, much less organized it for use. So there's not much to report here. Assessment and improvement occurred, but not in the comprehensive, quantitative, and reportable ways that satisfy program reviews. As scientists, we should understand the need for data-based decisions.

The breakdown had two main causes. The first was that we just didn't understand how to do program assessment. In that, new campus assessment leadership has helped immensely, and that's no longer a roadblock. The second cause was (and may continue to be) the lack of faculty and staff time needed to do proper assessment. The BT Program's Plan of Correction from the 2009 Program Review (Exhibit F) recommended personnel time be allocated to assessment. The Assistant to the Dean of the CNSM position gave some support, but assessment was only a fraction of the job description. The position no longer exists. This is labor-intensive, and the necessary personnel time has to come from somewhere.

There are, however, examples of assessment resulting in change, albeit not part of the BT Program assessment plan. As a graded assignment in the course Seminar for Teaching Assistants (BT 501), BT Program students have been asked to make recommendations to improve the program. In Fall 2012, the members of BT 501 drew up a list of proposed improvements for the WVSU Biotechnology Program (Exhibit K). In Spring 2013, BT 501 made a case for WVSU to offer courses and assistantships during the summer months. In Fall 2013, the new grad students focused on Shelter in Place (SHiP) safety at WVSU (Exhibit L). Individually and as a group, these graduate students demonstrated many of the qualities that are so important in professional life. Although these recommendations came from students new to the BT Program, they were encouraged to (and did) discuss things with veteran students.

Exhibits K and L contain these recommendations. Items we were able to enact included team-teaching assignments for GTAs, parking close to Hamblin Hall for GTAs and GRAs, and better scheduling of BT 501. For other items in which concrete change wasn't achieved, awareness was raised, leading to some improvements; examples include assigning GTAs to more lower-level teaching assignments, better library access, including more Bioinformatics in courses, better lab manuals. Recommendations we have not yet been able to accomplish include the entire range of recommendations about Shelter in Place.

The BT Program used formal evaluations of teaching for quality control and improvement. These included 1. campus-wide Faculty Evaluations, administered to BT students to assess their instruction in BT coursework; 2. evaluations of GTAs by the Instructor of Record in the course(s) they taught; 3. formal observations of (particularly) new GTAs by the BT Program Coordinator; and 4. similar evaluations designed by GTAs themselves and administered to their own students. See Exhibits H, I, and J, respectively; an example of formal evaluation 4 is not represented.

Exhibit U shows the assessment report for the Biotechnology Graduate Program for Academic Year 2013-2014, as part of the University's self-reflection.

Exhibit V shows the new assessment plan for the Biotechnology Graduate Program, 2014. As this was designed and implemented in Fall 2014, it is beyond the scope of this program review. We will do our best to make it work to its intended use.

3. Graduate and Employer Satisfaction

In the period under review, the goal was to develop an employer and an alumni survey, and to use the BT Program web site to administer it. This was not done, in part because the BT Program did not have sufficient access to its own web site. Data derived from this would have been useful to the BT Program and in this program review. As of Fall 2014, the BT Program Coordinator was given permission to run the web site, and hopes in Spring 2015 to get trained and do it. A variety of polls, including employer and alumni surveys, will be a regular feature on the BT Program web page.

F. Advisory Committee

As part of the plan of correction from the 2009 Biology and Biotechnology Program Reviews, an advisor committee was formed. This "Committee for Expectations, Standards and Assessment" was enlisted in Fall 2009, and met formally (i.e. agenda and minutes) five times from February 2010 through February 2012. The 13 members included faculty from Marshall, WVSU staff, faculty, and students (graduate and undergraduate), two MDs, and a WV DEP Environmental Biologist (see Exhibit W, Committee on Expectations, Standards and Assessment members. This single committee worked with both the Biology Department and the BT Program, and focused most of its attention on Biology.

Exhibit X is a list of the committee's recommendations over two years, and the status of those recommendations. As with the BT 501 student recommendations, it's easier to make recommendations than to enact them. Successes for the BT Program in this regard were limited to web site improvements and establishment of a social media (Facebook) presence. Perhaps the biggest disappointment was with respect to the goal of having the committee become engaged in program assessment. The committee wasn't as interested in that as in other tasks.

After approximately two years, the committee seemed to lose interest, and was discontinued until a better effort could be launched.

G. Program Strengths and Weaknesses

Strengths

1. The BT Program has excellent faculty and staff (see Section II B, above). The Gus. R. Douglass Institute on the WVSU campus bolsters us with additional personnel, facilities, and support. Through the USDA, they continue to fund four Graduate Research Assistantships per semester. In 2014, the BT Program became even more knitted together with "Land Grant." Our scope is extended through the (at least) 30 collaborators who are researchers at other institutions; see Exhibit Y, collaborators beyond the WVSU Biotechnology Graduate Program. We have good graduate students who take ownership of their education and research. We are large enough to cover an impressive range of Biotechnology sub-disciplines, but small enough to interact with our students closely. Nobody gets lost in the crowd, we get to know our students, and we mentor individual development in every aspect of professional life.

2. During the period of this review, the BT Program has grown and matured. We have secured sufficient funding (some $9.5 million, see Exhibit D) to fill our existing research space with students and equipment. We're getting more and better applicants, particularly internationals. Our graduates succeed in the next step of their careers. We continue to work out minor policies and procedures, but most of the framework is in place (see Exhibit G, Graduate Student Manual). We doubled our graduation rate. During the previous five-year Program Review, 13 students earned MS degrees. In this five-year period, there were 27.

3. When we started the Biotechnology Graduate Program in 2002, we hoped that it would benefit the Biology undergraduate program. Although the fiscal impacts are hard to measure without more clear budgeting, we think that the graduate program has "upped the game" of the undergraduate program. The graduate program has attracted high-quality faculty, who then teach undergrads in classes and in their labs. The graduate program means graduate students, who bring their skills, diversity, and enthusiasm to Hamblin Hall. The work of graduate students is essential in the success of the program in publications and grants, which benefits undergraduates. In turn, stronger WVSU undergrads help the graduate program. One way is by providing some of our best-in-state graduate students.

4. One of the strengths of the BT program is the mentoring of our graduate students. We select applicants carefully (see Section II C, Entrance Standards and Abilities, above). In their first semester, we enroll them in "Seminar for Teaching Assistants" (BT 501), which gives a weekly forum for identifying students' problems of whatever nature, monitoring and helping their teaching, getting feedback, and generally getting to know one another. We formally evaluate GTA's teaching, for their good as well as that of their students. The Program Coordinator keeps a spreadsheet of each student's progress through the timeline of the program and takes an active part in keeping things on track. Individual program faculty and staff take a personal interest in ensuring that

no student lacks housing, financial support, academic help, etc. By doing this, we hope nobody falls through the cracks.

Weaknesses

1. For a portion of the review period, we lacked a budget, and the costs and funding of the BT Program were not clear. Currently, The BT Program is largely funded from three sources: 1) The U.S. Department of Education's HBCU Master's Program; 2) the USDA National Institute for Food and Agriculture (NIFA); and 3) the National Science Foundation's West Virginia Experimental Program to Stimulate Competitive Research (EPSCoR). The largest source of funding to support the BT Program cones from HBCU Masters in the sum of $464,500. USDA-NIFA and WV EPSCoR annually funds the BT Program at the levels of $48,000 and $36,000, respectively. That is more than a half million dollars invested in one graduate programs, all from federal resources. Additionally, all of these sources are funded from a 5-year cycle and have become more consistent than even state funding.

To address the weakness and concern regarding the budgets, the Provost and Vice President for Academic Affairs will ensure that budgets from these three aforementioned BT Program funding sources are shared with the director of the BT Program.

2. We could use some staff support along the lines of the "Assistant to the Dean" position to do a slate of important tasks: public school outreach, recruiting in the state and region, alumni relations, and the running the BT web site (and other media). Faculty and staff are already stretched thin, and it simply takes personnel time to complete these tasks. This position would also be key in program assessment, both in the initial set-up phase and in on-going management.

The Provost and the Director of Title III Programs at WVSU are in the process of working with the BT Program to develop a staff support position to address many of the aforementioned needs of the Master's program. While funding continues to decrease, there appears to be an opportunity to use federal Title III funds and HBCU Masters funding to support a position along the line of an Assistant to Dean.

3. We could use better library access to journals in specialized sub-disciplines of Biology. Although it doesn't necessarily prevent students from getting access to recent papers, they mostly do it by using other people's library accounts at other universities.

The University has recently received approval from the US Department of Education, via the WVSU Title III Program to increase investment in library holdings and databases, especially in the areas of STEM. The goal is to increase the funding level by 10 percent annually over the next 5 year funding period.

4. Faculty are now getting a better understanding of what "program assessment" is and how to do it. To that fact, the University has developed a comprehensive, university-wide assessment plan and is in the process of establishing a consistent approach for collecting and analyzing assessment data. The culture of assessment needs to continue to expand to obtain visibility and support from all internal and external constituents. A centralized electronic repository for all assessment data collected will be defined.

Section III: Viability

A. Program Enrollment

During the time frame of this report, enrollment has grown steadily from 14 students in Fall 2009 to 19 in Spring 2014. We never bring in all applicants, not only because we reject some, but mainly because we have a limited number of assistantships, research faculty, and lab space. In fact, our acceptance decisions are in part limited by the number of current students that we expect to graduate.

B. Course Enrollment

For the numbers, see Appendix III-B.

Course enrollment necessarily tracks with program enrollment. Note that graduate students tend not to enroll in summer courses, mainly because tuition is not covered in the summer. Students only enroll in the summer if they intend to graduate in August (they must be enrolled in the semester they graduate).

We expect enrollment to be low in the courses Graduate Research (BT 590), Graduate Independent Study, or Research (BT 591) and Graduate Library Research (BT 592). These courses are for independent study (one-on-one with faculty), and are not counted in BT faculty teaching loads. They are offered to give students maximum flexibility in their schedules and in learning special topics.

Most graduate elective courses are paired with an undergraduate offering. Populating the course with both undergraduates and graduates helps us justify offering the course at all. Of course, more and more rigorous performance is required, and expectations are greater for graduate students than undergraduates.

C. Enrollment Projections

We project enrollment to stay at about 18-20 students per semester, with new enrollment and graduation rates to stay near current levels. This is the size we planned the BT Program to be when it was designed in 2001-2002. Unless we gain space and funds, it's all the bigger it should be.

D. Cost Analyses

A cost analysis is performed for the Program Review to provide data about the Departmental Cost of Instruction and the Facilities and Administrative Costs, which are not instructional driven, but attribute the overall educational experience of students.

Departmental Cost of Instruction:
The Departmental Cost of Instruction encompasses two components: 1. Departmental cost to offer the major; and 2. Departmental cost to offer courses in the department. To determine the departmental cost to offer the major, calculations are conducted to generate the program cost per graduate and the cost per student in the major. It should be noted that in this cost analysis we only considered the salaries including fringe benefits.

Calculation of the cost to offer the major: The numerator value is determined by using 2014-2015 faculty salary data for full-time and part-time faculty (including fringe benefits) who provide instruction for courses offered in the major (degree program). The value excludes salary compensation for instruction in general education courses (services courses) unless those courses are required for the major and serves as the numerator value for both the *program cost per graduate* and the *cost per student in the major* formulas.

Two denominator values are determined for the various calculations. For the program *cost per graduate* calculation, the denominator value is the average number of program graduates for the 2010-2014 period, while the *cost per student in the major* calculation uses the average number of majors in the degree program during the same review period as the denominator value.

The resulting formulas are:

$$\text{Cost per graduate} = \frac{\text{2014-2015 degree program instructional faculty}}{\text{Average number of program graduates 2010-2014}}$$

$$\text{Cost per student in the major} = \frac{\text{2014-2015 degree program instructional faculty}}{\text{Average number of majors in the degree program 2010-2014}}$$

Biotechnology program cost per graduate = $161,606/5.8 ~ $27,863
Biotechnology program cost per student in the major = $161,606/37.8 ~ $4275

Calculation for the departmental cost to offer courses in the department: The previously generated numerator value also serves as the numerator for this calculation. The denominator of this calculation is student credit hours produced for the academic years (2010-2014) of the five year review period. The credit hours produced is calculated using courses taken by both majors and non-majors.

The resulting formula is:
Cost of courses offered in the department =

$$\frac{\text{2014-2015 degree program instructional faculty}}{\text{Total student credit hours produced by department}}$$

Biotechnology Program cost per credit hour offered in the department
= $161,606/272 ~ $594

The Facilities and Administrative cost also using total faculty compensation for 2014-2015 as the numerator. For this value, the denominator federal indirect rate of 56.9%, which is a measure that is used to determine the cost of operation for grant administration.

The formula Facilities and Administrative cost (Non-instructional operational cost):

Facilities and Administrative cost = $\frac{\text{2014-2015 degree program instructional faculty}}{}$ * 0.569

Biotechnology Facilities and Administrative cost = $161,606 * 0.569 ~ $91,954

The ratios are exhibited in the table below.
Total Salary: $161,606

	Avg Majors (AY10-AY14)	Avg Graduates (AY10-AY14)	CPCH (AY 10-AY14)	Cost of Operation (AY 2014)
Average per year	37.8	5.8	272	0.569
Cost Ratios	$4275	$27,863	$594	$91,954

In summary, the total salary for faculty during the 2014-2015 year of the review period is $161,606 and includes both part-time and full-time faculty salaries. The average cost per major is $4275 while the average cost per graduate is $27,863. Both values include all unduplicated student majors and graduates for the 5-year review period. The cost of offering courses in the department for all students is based on the total semester credit hours (fall and spring combined) generated is $272 credit hours per year. The cost of operation (non-instructional cost) is $91,954.

E. Service Courses

N/A

F. Off-campus Courses

N/A

G. Articulation Agreements

N/A

Section IV: Necessity

A. Similar Programs

The closest similar program is the program at Marshall University just over 50 miles away. Rather than specializing in Biotechnology, their graduate programs in the Life Sciences are in Biomedical & Biomolecular Science, Ecology & Evolution, Watershed Management, Environmental Sciences, and Forensic Science. But even if our programs had to be compared head-to-head, corrected for program size and faculty teaching loads, our program is competitive with Marshall, or any school nationwide.

Graduates from the BT Program do not feed into any particular job. If there were such an employer in the region, we would certainly find a way to provide well-trained employees. Therefore we define "Biotechnology" broadly and prepare our students to be flexible as the field evolves. As such, we are pleased to note that our graduates from the review period have entered a variety of Biotechnology jobs.

B. Job Placement

Of the 27 students who graduated with MS degrees from the BT Program during this review period, 14 (52 percent) have found jobs in their field to date. Because the path to a desired science job often leads through more schooling (doctoral or professional schools), another nine graduates (33 percent) were successful in their next career step. The status of two more graduates is unknown.

Appendices

Appendix II-A: Curriculum Biotechnology Graduate Program MS degree and areas of concentration and courses that comprise each

Organismal / Environmental

Biol 510	Conservation Ecology	3 credits
Biol 521	Animal Parasitism	4
Biol 550	Evolution	3
Biol 565	Biology of Fishes	4
Biol 575	Principles of Aquaculture	4
Biol 605	Advanced Ecology	4
Biol 635	Animal Physiology	4
Biol 660	Environmental Microbiology	4
Biol 671	Advanced Environmental Microbiology	2
BT 501	Seminar for Teaching Assistants	1
BT 590	Graduate Research	1-4
BT 591	Graduate Independent Study or Research	1-4
BT 592	Graduate Library Research	2
BT 598	Industry Internship in Biotechnology	1-3
BT 599	Special Topics in Biotechnology	1-4
BT 695	Master's Thesis Research	1-9
Chem 512	Environmental Chemistry	3

Molecular / Microbial

Biol 550	Evolution	3 credits
Biol 561	Microbial Genetics	4
Biol 660	Environmental Microbiology	4
Biol 666	Cancer Biology	3
Biol 671	Advanced Environmental Microbiology	2
BT 501	Seminar for Teaching Assistants	1
BT 590	Graduate Research	1-4
BT 591	Graduate Independent Study or Research	1-4
BT 592	Graduate Library Research	2
BT 598	Industry Internship in Biotechnology	1-3
BT 599	Special Topics in Biotechnology	1-4
BT 695	Master's Thesis Research	1-9
Chem 512	Environmental Chemistry	3
Chem 525	Advanced Organic Chemistry	3
Chem 531	Biochemistry	3
Chem 533	Biochemistry Laboratory	2

Any course that a student's Master's Thesis Committee, in that student's Plan of Study, designates as a satisfactory elective course may be counted as an elective.

Appendix II-B: Faculty

These faculty taught in the Biotechnology Graduate Program from Fall 2012 through Spring 2014.

Dr. Kevin Barry

Dr. J. Mark Chatfield

Dr. Sean Collins

Dr. Jonathan Eya

Dr. Richard Ford

Dr. Micheal Fultz

Dr. Gerald Hankins

Dr. Robert Harris

Dr. David Huber

Dr. Umesh Reddy

Dr. Tim Ruhnke

Faculty Data Sheet

Name: Dr. Kevin Barry	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Maryland	**Data Degree Received: 2012**
Area of Specialization: plant ecology, invasive species	

Professional Registration/Licensure:
Years of employment at present institution: 3
Years of employment in higher education: 3
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 101, Principles of Biology	95
Spring 2013	Biol 101, Principles of Biology	48
	Biol 310/510, Conservation Ecology	7
	NSM 101, Freshman Experience	12
Fall 2013	Biol 101, Principles of Biology	105
	Biol 101H, Principles of Biology (honors)	2
Spring 2014	Biol 101, Principles of Biology	48
	Biol 250, Ecology	11

(B) If degree is not in area of current assignment, explain:

(C) Identify your professional development activities during the past five years.

I attended the Ecological Research as Education Network (EREN) meeting this summer, where I became involved in several research projects designed to involve undergraduates in large-scale ecological research. EREN is an NSF-funded organization of faculty at small universities whose goal is to integrate undergraduate education and long-term ecological research.

I am a member of the Ecological Society of America (ESA), the Botanical Society of America (BSA), and the American Association for the Advancement of Science (AAAS)

I am working with Drs. Reddy, Huber, and Haas on a recently awarded $260,000 grant to study the genomics of adaptation to mine soils.

Thus far we have visited our field sites, have developed a sampling plan, and are working on further developing certain aspects of both the observational and manipulative parts of the research before beginning sampling and planting in the field.

My research student Jordan Dillon received a $2500 NASA Space Grant Scholarship for the project “Secondary metabolite production in Ailanthus altissima under varying light levels”. The proposal is attached below.

In the summer and fall of 2013 I mentored Jordan Dillon during his work on the NASA funded project “Secondary metabolite production in Ailanthus altissima under varying light levels”. The research involved locating and sampling A. altissima leaves, creation of leaf extracts in the lab, and testing of various leaf extracts on radish seed germination. Data analysis for this project is till underway, and Jordan has begun work on a PowerPoint presentation at an upcoming Honors Program meeting.
I also mentor Vasilios Dianellos on his AmeriCorps project.

Native Plant Garden – The Hamblin Hall Native Plant Garden was installed on Earth Day in April 2013 with the help of several undergraduate students, staff, and faculty. During the planting of the garden, I was interviewed by local news and the Daily Mail. The garden currently contains 12 different native species, and was enhanced and maintained with the help of undergraduate Jordan Dillon in summer 2013. To educate students and visitors about the garden and native species, I maintain a weekly updated chalkboard that I place outside of Hamblin Hall to highlight which species are in bloom, and interesting facts about the species. Since all garden species are perennial, the garden will become more lush and full this upcoming Spring and Summer. The garden proposal is attached below.

Ecological Research as Education Network (EREN) – I am planning a long-term study on forest dynamics as part of a multi-site EREN project. This study, which involves monitoring tree growth and changes in forest structure, will be conducted at Kanawha State Forest. Additionally, I will use these sites for research on leaf decomposition and invasive species, also as part of EREN. This leaf decomposition project would involve placing the leaves of Ailanthus altissimia and a native species in mesh bags and monitoring their mass over time. Plots will also be monitored for the invasive insect emerald ash borer, and the presence and identity of invasive earthworms may also be monitored. This research and variations on these projects will be largely driven by undergraduates.

Tree Campus USA – I serve as on the Tree Advisory Board for WVSU’s Tree Campus USA initiative.

Hamblin Hall greenhouse – I measured the Hamblin Hall greenhouse and drew up a schematic plan for installation of Dr. Nimmakayala’s extra growth lights. Work began on this project, with several struts already installed to support lights, but other projects have unfortunately drawn away the attention of Physical Facilities. Once the lights are installed it will improve greenhouse yields, especially during the winter, and make the space more effective as a teaching greenhouse.

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

(E) Indicate any other activities that have contributed to effective teaching.

(F) List professional books/papers published during the last five years.

(G) List externally funded research (grants and contracts) during the last five years.

Faculty Data Sheet

Name: Dr. Mark Chatfield	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Oregon State University	**Data Degree Received:**
Area of Specialization: plant physiology, genetics, biochemistry	

Professional Registration/Licensure:
Years of employment at present institution: 23
Years of employment in higher education: 31
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 120, Fundamentals of Biology	61
	Biol 121, Biological Diversity	15
	Biol 444/644, Plant Physiology	6
	Biol 490, Directed Student Research	2
Spring 2013	Biol 110, Economic Biology	10
	Biol 490, Directed Student Research	1
	Chem 331/531, Biochemistry	24
	Chem 333/533, Biochemistry lab	8
Fall 2013	Biol 108, Environmental Biology	30
	Biol 440/640, Field Botany	4
	Biol 490, Directed Student Research	3
Spring 2014	Biol 121, Biological Diversity	52
	Chem 331/531, Biochemistry	21

(B). If degree is not in area of current assignment, explain: [degree is in area of assignment]

(C). Identify your professional development activities during the past five years.

Toured World Food Program in Nairobi Kenya, July 2013 During the Summer break I participated by leading tours of several World Food Program Centers in Nairobi Kenya with Padma Nimmakayala and several WVSU undergraduate and graduate students. We were in Kenya for 2 weeks.

I am a Co-PI on a CBG for this travel but I can't remember what year it was awarded 2012 maybe?

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Invited lecturer in Biochemistry at Universidad Autonoma de Coahuila in Torreon Mexico November 2012

(E). Indicate any other activities that have contributed to effective teaching.

Trained in Quality Matters Online teaching Courses at WVSU 2012-2013

(F). List professional books/papers published during the last five years. [none since 2007]

(G). List externally funded research (grants and contracts) during the last five years.

a. Successful grant application to non-WVSC source – Yes CBG Online Learning for $499,000
b. Unsuccessful grant application to non-WVSC source: - Yes CBG Peppers for $499,000.

Faculty Data Sheet

Name: Dr. Sean Collins	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Illinois	**Data Degree Received: 2003**
Area of Specialization: entomology, ecology	

Professional Registration/Licensure:
Years of employment at present institution: 8
Years of employment in higher education: 8
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 250, Ecology	16
	Biol 320/599, Entomology	5
	Biol 411/BT511, Senior Seminar/Biotech Seminar	19
Spring 2013	Biol 121, Biological Diversity	18
	Biol 250, Ecology	25
	Biol 399, Herpetology	13
	Biol 121, Biological Diversity	52, team-taught
	Biol 326, Vertebrate Zoology	12

(B) If degree is not in area of current assignment, explain:

My Ph.D. from the University of Illinois is in Entomology

(C) Identify your professional development activities during the past five years.

Served as WVSU's representative to the Advisory Council of Faculty (2010 - 2011)

WebCT workshops (2009 - 2010)

NSF Bioinformatics workshop in Little Rock, AR (2013)

Served on 2 grant review panels for the National Institutes for Food and Agriculture (USDA) for years 2013 and 2014.

I assisted with aspects of the planning for the West Virginia Academy of Sciences research symposium held on

campus, as well as moderated a session of oral presentations and served as a judge for the poster competition (2012).

I was a member of a group from WVSU that was invited to Elizabeth City State University (NC) to discuss a planned grant proposal to the National Science Foundation.

North Central Self-Study Criterion Committee (Criterion 2 [integrity], Core components C & D)

Served on the Biology department subcommittee for establishing the guidelines for the rubrics, courses, and assignments to be used for accreditation using LiveText

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

(E) Indicate any other activities that have contributed to effective teaching.

I have served as the content specialist for the following Education students over the last 5 years:
Howard Mize, Brian Lanham, Danielle Perry, Allison Belcher, Ann Lucas, Ronald Smith, Desiree Unselt, Elisha Westfall, Lorrie Mottesheard and Pamela Darnold

(F) List professional books/papers published during the last five years.

Size variation in cicada killer wasps (*Sphecius speciosus*) from urban and rural nesting aggregations. (presented by Hunter Aliff)- Abstract

Genetic variation in cicada killer wasps (*Sphecius speciosus*) from urban and rural nesting aggregations. (presented by Belinda Fox)- Abstract

Size variation in cicada killer wasps from urban and rural nesting aggregations. (Poster presentation by Hunter Aliff and Michael McClain)- Abstract

(G) List externally funded research (grants and contracts) during the last five years.

Association of gene expression profiles of oxidative phosphorylation and nutrient efficiency, growth and development in different life stages of rainbow trout, *Oncorhynchus mykiss.* NSF Capacity Building Grant; Co-PI with Dr. Jonathan Eya (2012)

Faculty Data Sheet

Name: Dr. Jonathan Eya	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Auburn University	**Data Degree Received: 1997**
Area of Specialization: fisheries science, aquaculture	

Professional Registration/Licensure:
Years of employment at present institution: 15
Years of employment in higher education: 21
Years of related experience outside higher education: 3

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2012	Biol 101, Principles of Biology	48
Fall 2012	Biol 101, Principles of Biology	48
	BT 567, Current Concepts in Biotechnology	10, team-taught
Spring 2013	Biol 101, Principles of Biology	48
Fall 2013	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 101, Principles of Biology	48

(B). If degree is not in area of current assignment, explain: NA

(C). Identify your professional development activities during the past five years.

Organized a collaborators meeting five scientists from Mississippi State University, USDA-ARS Catfish Genetics Research Center and USDA-ARS National Center for Cool and Coldwater Aquaculture to evaluate the progress of the USDA funded research in July 2009

Presented “Genetic relationships of growth, feed efficiency and mitochondrial function in rainbow trout fed diets differing in dietary lipid levels” and “Effects of strain and diet on growth performance characteristics and relative expression of genes coding for electron transport chain in channel catfish "and “Aspects of mitochondrial function, growth and nutrient efficiency of rainbow trout fed diets containing different levels of dietary fat” Aquaculture America 2012, Las Vegas, Nevada. February 20 – March 2, 2012.

Presented “Relationship and genetic variation to mitochondrial function in growth performance and feed efficiency of juvenile rainbow trout, Oncorhynchus mykiss.” and “Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish, Ictalurus

punctatus)." The Annual International Conference and Exposition of the World Aquaculture Society. Natal Convention Center, Natal/RN Brazil. June 6-10, 2011.

Presented "Mitochondrial Function and Growth in Channel Catfish: Strain and Diets Effects." and "A possible association of mitochondrial function with feed efficiency in rainbow trout Oncorhynchus mykiss: diets and full-sib family effects" 1890 institutions of Association of Research Directors 16th Biennial Research Symposium at Atlanta, Georgia, April 9- 13, 2011.

Was a collaborator in a grant involving 1890 institutions, 1862 institutions and Federal Government agencies and the proposal was submitted to USDA-NIFA and the proposal was not funded.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Participated in the USDA-CSREES/CP Small Business Innovation Research Peer Review System (December 2009).

Participated in the National Oceanic and Atmospheric Administration (NOAA) Research Peer Review System (December 2010).

(E). Indicate any other activities that have contributed to effective teaching.

Attendance of conferences (national and international) and acquiring knowledge of the latest development in my area of expertise as well as other areas and utilizing the knowledge gained in my teaching.

(F). List professional books/papers published during the last five years.

Eya, J.C. Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2014. Effects of dietary lipid levels on mitochondrial gene expression in low and high-feed efficient families of rainbow trout (Oncorhynchus mykiss). Journal of Fish Biology 84: 1708-1720.

Eya, J.C. Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2013. Effects of dietary lipid levels on growth, feed utilization and mitochondrial function in low- and high- feed efficient families of rainbow trout (Oncorhynchus mykiss). Aquaculture 416-417: 119-128.

Eya, J.C., Ashame, M.F. Pomeroy, C.F., Manning, B.B. and Brian, B.C. 2012. Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish (Ictalurus punctatus). Comparative Biochemistry and Physiology Part B 163: 211-220.

Eya, J.C., Ashame, M.F. and Pomeroy, C.F. 2011: Association of mitochondrial function with feed efficiency in rainbow trout: Diets and family effects. Aquaculture 321(1-2):71-84.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Influence of diet on mitochondrial complex activity in channel catfish, Ictalurus punctatus. North American Journal of Aquaculture 72: 225-236.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Nutritive evaluation of protein from anaerobically digested poultry wastes as a dietary ingredient replacer for channel catfish, Ictalurus punctatus. Journal of World Aquaculture Society 41(S2):179-190.

Eya, J.C., Ashame, M.F. and Pomeroy, C. 2010. Researchers study effect of diet and strain on catfish production. Aquaculture North America, July/August, page 7.

(G). List externally funded research (grants and contracts) during the last five years.

DOD - Research and Education Program Grant No. W911NF-14-1-0122 ($156,336), P1.

USDA – Capacity Building Grant No. 2011-38821-31130 ($295,663), PI.

Faculty Data Sheet

Name: Dr. Richard Ford	**Rank: Associate Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Miami University (OH)	**Data Degree Received: 1993**
Area of Specialization: micro/molecular genetics	

Professional Registration/Licensure:
Years of employment at present institution: 13
Years of employment in higher education: 15
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 210, Basic Anatomy and Physiology	29
	NSM 101, Freshman Experience	9
	BT 501, Seminar for Teaching Assistants	6
Spring 2013	Biol 101, Principles of Biology	21
	Biol 345/599, General Virology	7
	BT 510, Seminar for Teaching Assistants	4
Fall 2013	Biol 120, Fundamentals of Biology	90
	BT 501, Seminar for Teaching Assistants	4
Spring 2014	Biol 101, Principles of Biology	45
	NSM 101, Freshman Experience	20
	BT 501, Seminar for Teaching Assistants	3

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Since Fall 2009, I did my last two years as Biology Department Chair / Biotechnology Graduate Program Director (Fall 2009 - Spring 2012). I resumed the job of Biotech Coordinator (Fall 2013 - present). I have been the WVSU Faculty Representative to HEPC's Advisory Council of Faculty (Fall 2011 - present). I developed and taught new courses at dual undergraduate/graduate levels: Immunology (Spring 2012) and General Virology (Spring 2013), and one new graduate level course: Seminar for Teaching Assistants (Fall 2012). I became Editor for the Proceedings of the West Virginia Academy of Science (Spring 2012 - present), served on the WVAS Executive Committee (Spring 2012 - present), and hosted the combined WVAS / STaR Symposium meetings at WVSU (April 20-21, 2012). I have served on many departmental and campus-wide committees, served on at least three search committees. I have been on at least three Master's Thesis Committees.

My professional development has been the product of learning and doing these jobs.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

(G). List externally funded research (grants and contracts) during the last five years.

Faculty Data Sheet

Name: Dr. Micheal Fultz	**Rank: Assistant Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Indiana University	**Data Degree Received: 2009**
Area of Specialization: organic chemistry	

Professional Registration/Licensure:
Years of employment at present institution: 6
Years of employment in higher education: 6
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2014	BT 599, Specrtoscopic Methods	1

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

I have been a member of the local American Chemical Society Section for the last 5 years serving on the executive committee for the last four. I also serve as the faculty adviser for the student group on campus. Over the last four years I have taken students to 4 national meeting where they presented 13 presentations in research and teaching.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

2013 West Virginia State University FACET Outstanding Teacher Award

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Fultz, Micheal, W.; Rollyson, William, Pyrazines and Quinoxalines. In Heterocyclic Chemistry in Drug Discovery; Li, J. J. Ed. Wiley and Sons: New York, 2013, Chapter 10.

Fultz, Micheal, W. Borshe-Drechsel cyclization. In Name Reactions in Heterocyclic Chemistry II; Li, J. J., Ed. Wiley and Sons: New York, 2011, Chapter 3.2, pp 91-101.

Williams, D. R.; Fultz, M.W.; Christos, T. E.; Carter, J. S. A general preparation of (Z)-1-fluorostilbene derivatives for the design of conformationally restricted peptidomimetics, Tet. Lett. 2010, 51, 121-124.

(G). List externally funded research (grants and contracts) during the last five years.

Department of Defense “Acquisition of HPLC-Mass Spectrometer” – West Virginia State University” Micheal Fultz (PI), 2013, $324,893

West Virginia Research Trust Fund “Acquisition of Gas Chromatograph” – West Virginia State University” Micheal Fultz (PI), 2013, $20,000

West Virginia Idea network for Biomedical Research “Chiral sulfonation and synthesis of gliotoxin isomers with anticancer properties” Micheal Fultz (PI), 2013, $26,560

West Virginia Idea network for Biomedical Research “Synthesis of 6-deoxy-5a,6-didehydrogliotoxin (1) and bis(dethio)-10a-methylthio-3a-deoxy-3,3a-didehydrogliotoxin” Micheal Fultz (PI), 2012, $24,526

West Virginia Research Trust Fund “Acquisition of 400 MHz NMR – West Virginia State University” R. Charles Byers (PI), Micheal Fultz, Genia Sklute, Gerald Hankins, Ernest Sekabunga, Katherine Harper, 2011, $100,000

West Virginia Idea network for Biomedical Research “Acquisition of 400 MHz NMR – West Virginia State University” Micheal Fultz (PI), 2011 $30,000

National Science Foundation “West Virginia State University Planning Grant for STEM Program Evaluation and Improvement” R. Charles Byers (PI), Micheal Fultz, Sonya Armstrong, Thomas Guetzloff, Katherine Harper, 2011, $67,551

Faculty Data Sheet

Name: Dr. Gerald Hankins	**Rank: Associate Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Virginia	**Data Degree Received: 1991**
Area of Specialization: developmental genetics	

Professional Registration/Licensure:
Years of employment at present institution: 9
Years of employment in higher education: 23
Years of related experience outside higher education: 10

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2013	NSM 101, Freshman Experience	10
	BT 555, Biostatistics	11
	BT 572, Techniques in Biotechnology II	10, team-taught
Fall 2013	NSM 101, Freshman Experience	22
	BT 567, Current Concepts in Biotechnology	11, team-taught
	Biol 441/BT511, Senior Seminar/Biotechnology Seminar	19
	Biol 466/666, Cancer Biology	9
Spring 2014	NSM 101, Freshman Experience	15
	BT 555, Biostatistics	8
	BT 572, Techniques in Biotechnology II	8, team-taught

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Professional Affiliations: American Association for the Advancement of Science
American Council for Medicinally Active Plants
Genetics Society of America
West Virginia Academy of Science
Member, Cell Differentiation + Development Center, Marshall University

Presentations at:

NIH Biennial National IDeA Symposium of Biomedical Research Excellence (2010, 2012, 2014)
Gordon Research Conference on Fibroblast Growth Factors in Development & Disease (2014)
Genetics Society of America conference on Model Organisms to Human Biology: Cancer Genetics (2012)

Gordon Research Conference on Cancer Genetics & Epigenetics (2011)
Annual Conference of the American Council for Medicinally Active Plants (2010, 2011)
American Society for Biochemistry and Molecular Biology Special Symposium: Biochemistry And Cell Biology Of ESCRTs In Health And Disease (2010)
Annual Meeting, American Society of Pharmacognosy (2010)

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Nimmakayala P, Abburi VL, Abburi L, Alaparthi SB, Cantrell R, Park M, Choi D, Hankins G, Malkaram S, Reddy UK, Linkage disequilibrium and population structure analysis among Capsicum annuum L. cultivars for use in association mapping. Molecular Genetics and Genomics 289 (4): 513-521, 2014 [PMID: 24585251]

Reddy UK, Almeida A, Abburi VL, Alaparthi SB, Unselt D, Hankins GR, Park M, Choi D, Nimmakayala P, Identification of gene-specific polymorphisms and association with capsaicin pathway metabolites in Capsicum annuum L. collections. PLOS One 9: e86393, 2014 [PMID: 24475113]

Manohar S, Harlow M, Nguyen H, Li J, Hankins GR, Park M, Chromatin modifying protein 1A (Chmp1A) of the endosomal sorting complex required for transport (ESCRT)-III family activates ataxia-telangiectasia mutated (ATM) for PanC-1 cell growth inhibition. Cell Cycle 10 (15): 2529-2539, 2011 [PMID: 21705858]

(G). List externally funded research (grants and contracts) during the last five years.

Editor's note: Dr. Hankins submitted too much information to fit into two pages. He cited 12 externally-funded grants totaling over $1.3 million. Five examples are:

" Cytation 3 Cell Imaging Multi-mode reader and high-speed spectrophotometer", Equipment subaward from NIH grant 5P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence, $72,091.

“Alternative Utilization of Roselle Hibiscus as a Small Farm and Niche Market Crop”, Co-PI (PI: Dr. Kit Chin, SUBR Southern University) September 1 2012-August 31 2015, USDA/NIFA 2012-38821-20092, WVSU part: $50,000.

"Transdermal patch development of capsaicin using genomic approach for treatment of chronic low back pain", Mentor (P.I.: Gagan Kaushal, University of Charleston, Co-PI: Umesh Reddy, WVSU), Sept 1 2012-Aug. 31 2014, NSF RII subaward, $80,000.

“Development of value added peppers using genomic driven association mapping”, Sept. 1 2010-Aug. 31 2013, USDA/NIFA 2010-38821-21574, $299,810.

"Sex steroid hormones and epigenetics in meningiomas", May 1 2010-April 30 2014, WV-INBRE, NIH 5P20RR016477 & P20GM103434, $690,000.

Faculty Data Sheet

Name: Dr. Robert T. Harris	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Ohio University	**Data Degree Received: 1992**
Area of Specialization: biomedical science	

Professional Registration/Licensure:
Years of employment at present institution: 19
Years of employment in higher education: 21
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Spring 2013	Biol 331, Human Anatomy and Physiology I	24
	Biol 332, Human Anatomy and Physiology II	14
Fall 2013	Biol 331, Human Anatomy and Physiology I	19
	Biol 332, Human Anatomy and Physiology II	13
	Biol 370/599, Pharmacology	20
	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 331, Human Anatomy and Physiology I	21
	Biol 332, Human Anatomy and Physiology II	13

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

WVSC Outstanding Faculty Recognition; April 2010

1st Annual Conference of the American Council for Medicinally Active Plants Racine CR et.al. Anti-tumor properties and effects on vascular smooth muscle cell proliferation and migration of extracts of Hibiscus sabdariffa accessions. 1st Annual Conference of the American Council for Medicinally Active Plants, Rutgers University, New Brunswick, NJ, July 20-23, 2010.

51st Annual Meeting of the American Society of Pharmacognosy Racine CR et. al. In vitro screening of Hibiscus sabdariffa extracts for anti-tumor properties. 51st Annual Meeting, American Society of Pharmacognosy, St. Petersburg Beach, FL, July10-14, 2010.

WV IDEA Conference Harris, RT et al. Smooth Muscle Cells have an Inherent Capacity to Form Tube-Like Structures, WV IDEA Conference, Huntington, WV, March 23, 2010.

(E). Indicate any other activities that have contributed to effective teaching.

Hosted a Visiting Scientist for 3 months: Dawn Turner, Ph.D. Mountain State University

(F). List professional books/papers published during the last five years.

Kevin M. Rice, Sunil K. Kakarla, Sriram P. Mupparaju, Anhaiah Katta, Miaozon Wu, Robert T. Harris and Eric R. Blough . Shear stress activates Akt during vascular smooth muscle cell reorientation. Biotechnology and Applied Biochemistry 55: 85-90, 2010.

Rahul P. Nagmal, James R. Tchabo, Eric R. Blough, Robert T. Harris, Resveratrol attenuates fluprostenol induced hypertrophy of vascular smooth muscle cells. Biophysical Journal 98(3) Supplement 1: 4330, 2011.

Gary Hunter and Robert T. Harris. Structure and Function of the Muscular, Neuromuscular, Cardiovascular, and Respiratory Systems (chapter 1). In: Essentials of Strength Training and Conditioning. Third edition, Human Kinetics, (R. Earle, ed.) pp. 3-19. (2009)

K. M. Rice, S. Uddemarri, R. S. Kinnard, R. Harris, G.L. Wright, and E. R. Blough. Fluprostenol-induced ROS-dependent A7R5 smooth muscle cell hypertrophy involves the activation of mTOR, p70S6k, and PTEN. Prostaglandins Other Lipid Mediat. 85:49-57.

(G). List externally funded research (grants and contracts) during the last five years.

Effects of Muscle Loading and Unloading on microRNA Expression. Harris. NASA EPSCoR- MURC. $40,000.
Development of Value-Added Peppers Using Genomic Driven Association Mapping. Hankins, Harris, Reddy. USDA $299,937.

Influence of the HDAC inhibitor Trichostatin A on Hypertrophic and Atrophic Responses of Smooth and Skeletal Muscle. West Virginia Space Gant Consortium; Robert Harris, James Tchabo (graduate student), $12,000.

Mechanotransduction, Intracellular Signaling and Vascular Cell Biology, National Institute of Health, West Virginia INBRE program, $521,422, May 2009-April 2012. Robert T. Harris

Response of Vascular Smooth Muscle Cells to Stretch, National Institute of Health, West Virginia INBRE program, $1,140,000, June 2004-August 2009. Robert T. Harris

Research Support Program, West Virginia INBRE program, $190,000, June 2004-August 2009. Robert T. Harris

Faculty Data Sheet

Name: Dr. David Huber	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Michigan State University	**Data Degree Received: 1996**
Area of Specialization: microbial ecology, microbial genetics, plant pathology	

Professional Registration/Licensure:
Years of employment at present institution: 15
Years of employment in higher education: 15
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 341, Microbiology	16
	BT 567, Current Concepts in Biotechnology	5
Spring 2013	Biol 241, Introduction to Microbiology	10
	BT 572, Techniques in Biotechnology II	10, team-taught
Fall 2013	Biol 341, Microbiology	22
	BT 567, Current Concepts in Biotechnology	11, team-taught
Spring 2014	Biol 241, Introduction to Microbiology	8
	Biol 361/561, Microbial Genetics	10
	BT 572, Techniques in Biotechnology II	8, team-taught

(B). If degree is not in area of current assignment, explain. Not relevant

(C). Identify your professional development activities during the past five years (Fall 2012 – Sp 2014).

Professional Meetings Attended

- American Society for Microbiology Annual Meeting, Denver, CO, May 2013; abstract and poster
- USDA Association of Research Directors Biannual Meeting, Jacksonville (FL), April 2013
- American Society for Microbiology Annual Meeting, Boston, MA, May 2014; abstract and poster
- 5 presentations at professional meetings in 2012; 7 presentations in 2013. (details available)

Host to Visiting International Research Collaborators

- Dr. Nagamani Balagurusamy (Universidad Autonoma de Coahuila, Mexico) visited my laboratory for a week in April. He also was a guest teacher in my new Microbial Systems Science (BIOL 599) class.

- Dr. Teodoro Espinosa-Solares (Universidad Autonoma Chapingo, Mexico). Espinosa visited my laboratory in order to collaborate on anaerobic digestion research.

Host to Visiting International Graduate Student Researchers: 3 from Mexico (details available)

(D). List awards/honors (including invitations to speak) None

(E). Indicate any other activities that have contributed to effective teaching.

- USDA CBG Research/Teaching Integration grant listed below. This grant was designed to also build teaching capacity: biotechnology resources at WVSU were increased through purchase of $100,000 Roche pyrosequencing instrument; new class was created (Microbial Systems Biology); workshop training was provided (Microbial Metagenomics Workshop)

- Agilent Gas Chromatograph ($40,000) was purchased for teaching and research through the NSF EPSCoR RII multi-institution grant (listed below)

- Upward Bound teaching to local elementary children (summer 2013)

(F). List professional books/papers published during the last five years.

Refereed Journal Publications

Shade, A., Peter, H., Allison, SD, Baho, DL, Berga, M., Burgmann H., Huber DH, Langenheder, S., Lennon, JT, Martiny JBH, Matulich KL, Schmidt TM, and Handelsman J. 2012. Fundamentals of microbial community resistance and resilience. Frontiers in Microbiology 3:417. (doi:10.3389/fmicb.2012.00417)

Sharma, D., Espinosa-Solares, T., Huber, DH. 2013. Thermophilic anaerobic co-digestion of poultry litter and thin stillage. Bioresource Technology. 136:251-256.

Smith, A.M., Sharma, D., Lappin-Scott, H., Burton, S., Huber, D.H. 2014. Microbial community structure of a pilot-scale thermophilic anaerobic digester treating poultry litter. Applied Microbiology and Biotechnology 98(5):2321-2334. (doi 10.1007/s00253-013-5144-y).

Rivera-Salvador, V., I.L. Lopez-Cruz, T. Espinosa-Solares, J.S. Aranda-Barradas, D.H. Huber, D. Sharma, J.U. Toledo. 2014. Application of Anaerobic Digestion Model No. 1 to describe the syntrophic acetate oxidation of poultry litter in thermophilic anaerobic digestion. Bioresource Technology 167:495-502.

Book chapter

Alvarado A, Nafarrate E, Huber D, Balagurusamy N (2012) Microbiología de la digestión anaerobia. In Balagurusamy N, Das KC (ed), Advances Tecnologicos en la Produccion de Biogas: Perspectives y Retos. Lap Lambert Academic Publishing, Saarbrücken, Germany.

(G). List externally funded research (grants and contracts) during the last five years.

Federal Grants as Principal Investigator (PI)

David Huber (PI), Ami Smith (Co-PI), Marek Krasnansky (Co-PI). USDA 1890 Research/Teaching Capacity Building Grant. Title: Implementing metagenomics-enabled systems analysis to engineer energy thresholds and resilience in microbial bioenergy communities. Amount: $564,000. Award dates: 9/2010-8/2014

Faculty Data Sheet

Name: Dr. Umesh Reddy	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: Osmania University	**Data Degree Received: 1997**
Area of Specialization: genetics	

Professional Registration/Licensure: genetics, genomics and biotechnology
Years of employment at present institution: 10
Years of employment in higher education: 20
Years of related experience outside higher education: 1

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 411/BT 511, Senior Seminar/Biotech Seminar	20
Spring 2013	BT 572, Techniques in Biotechnology II	8
	Biol 270, Genetics	10
Fall 2013	Biol 411/BT 511, Senior Seminar/Biotech Seminar	25
	Biol 399/599, Crop Biodiversity and Genome	10

(B) If degree is not in area of current assignment, explain:

(C) Identify your professional development activities during the past five years.

1. Attended 25 national and international conferences
2. Federal grants funded up to two million dollars from USDA-NIFA
3. Supervised 12 graduate students for their thesis research
4. Served as member in 20thesis committees
5. Supervised 15 undergraduate student research
6. Published 25 research papers in peer reviewed journals
7. Organized high school student/teacher workshops in DNA techniques
8. Attended grant review panels
9. Reviewed 100 manuscripts for various journals
10. Served as chair for Research and Development committee
11. Supervised 5 postdoctoral research associates
12. Hosted 6 visiting scientists from India/Mexico

(D) List awards/honors (including to speak in your area of expertise) or special recognitions in the last five years.

Five invited talks in Plant and Animal Genome Conference in San Diego in various genomic workshops

(E) Indicate any other activities that have contributed to effective teaching.

Developed laboratory modules for teaching various biotechnology techniques such as PCR, sequencing, genome analysis, mapping, cloning, genetic diversity, microarrays, alternative splicing, epigenetics, functional validation and qRT PCR for graduate and undergraduate students.

Obtained one million dollar funding from USDA-NIFA higher education proposals to strengthen facilities to teach biotechnology and genomics.

Editor's notes in italics. Dr. Reddy submitted too much material to fit into two pages, so I cut out the details. Dr. Reddy listed the four USDA-NIFA grants. I chose one example:

1. Stories of Crop Evolution, Biodiversity and Domestication and Methods of Genomic Assisted Crop Improvement for Curricula Development. (Contract/Grant/Agreement No: 2010-38821-21476 Proposal No: 2010-02247 Start: 01 Sep 2010 Term: 31 Aug 2013 Grant Yr: 2010 Grant Amount: $299,986)

(F) List professional books/papers published during the last five years.

Editor: Dr. Reddy listed 21 published papers on which he was an author. Two examples are:

1. Padma Nimmakayala, Amnon Levi, Lavanya Abburi, Venkata Lakshmi Abburi, Yan R. Tomason, Thangasamy Saminathan, Venkata Gopinath Vajja, Sridhar Malkaram, Rishi Reddy, Todd C. Wehner, and Umesh K. Reddy 2014. Single nucleotide polymorphisms generated by genotyping by sequencing used to characterize genome-wide diversity, linkage disequilibrium and selection sweep for worldwide cultivated watermelon. BMC Genomics 2014, 15:767 (Highly accessed)

2. REDDY UK, NIMMAKAYALA P, LEVI A, ABBURI VL, SAMINATHAN T, TOMASON YR, VAJJA G, REDDY R, ABBURI L, WEHNER TC, RONIN Y, KAROL A. 2014 High-Resolution Genetic Map for Understanding the Effect of Genome-Wide Recombination Rate on Nucleotide Diversity in Watermelon. G3: Genes|Genomes|Genetics. doi: 10.1534/g3.114.012815.

(G) List externally funded research (grants and contracts) during the last five years.

Editor: Dr. Reddy listed seven externally-funded grants (in addition to the four shown in section E, above. These total over $2.5 million. Four examples are:

1. Syntenic analysis of cucurbit cultivar complex for widening genetic diversity and functional genomics of fruit quality and architecture. Contract/grant/agreement no: 2007-38814-18472 proposal no: 2007-03466 start: 01 Sep 2007 term: 31 Aug 2011 Fy: 2009 grant yr: 2007, grant Amount: $499,762

2. Utilization of genomics for molecular breeding of high quality and disease resistant peppers contract/grant/agreement no: 2010-38814-13906 start: 01 Sep 2010, Grant Amount: $299,647

3. Genome-wide association mapping for improving nutraceutical traits in pumpkin and squash contract/grant/agreement no: 2012-38821-20277 proposal no: 2012-02508 start: 01 Sep 2012 term: 31 Aug 2015: Grant Yr: 2012, Grant Amount: $299,832

4. LD mapping of fruit traits in combination with transcriptomics of ploidy levels in watermelons to develop high yielding seedless cultivars. Accession no: 0223919 USDA-NIFA start: 01 Oct 2010 term: 30 Sep 2014 Fy: 2012; Grant Amount: $500,000

Faculty Data Sheet

Name: Dr. Tim Ruhnke	**Rank: Professor**
Status: X Full-Time □ Part-Time □ Adjunct □ Graduate Asst.	**Highest Degree Earned: Ph.D.**
Degree Conferred by: University of Connecticut	**Data Degree Received: 1993**
Area of Specialization: zoology, parasitology	

Professional Registration/Licensure:
Years of employment at present institution: 19
Years of employment in higher education: 21
Years of related experience outside higher education:

To determine compatibility of credentials with assignment:

(A) List courses you taught in the last two years (fall and spring semester) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these course you taught. For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number and Title	Enrollment
Fall 2012	Biol 120, Fundamentals of Biology	48
	Biol 121, Biological Diversity	24
Spring 2013	Biol 120, Fundamentals of Biology	48
Fall 2013	Biol 121, Biological Diversity	12
Spring 2014	Biol 120, Fundamentals of Biology	30
	Biol 350/550, Evolution	4

(B). If degree is not in area of current assignment, explain:

(C). Identify your professional development activities during the past five years.

Campus Governance and Service

2010-present	Chair, Faculty Senate.
2012-present	Ex-officio member, WVSU Foundation Board.
2014	Member, Provost Search Committee.
2013	Member, Associate Provost Search Committee.
2013	Member, Shelter in Place Task Force.
2012	Member, Bioinformatics Research Associate Search
2012	Member, Admission Director Search Committee
2012-2013	Chair, Degree Completion Task Force.
2010-2013	Advisor, Beta Kappa Chi.

Manuscript Review

2014 Comparative Parasitology
2013 International Journal for Parasitology
2012 Folia Parasitologica and Comparative Parasitology
2011 Folia Parasitologica
2010 Vestnik Zoologii (Ukraine) and Comparative Parasitology
2009 Systematic Parasitology (2 manuscripts), Journal of Parasitology

D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years.

Ruhnke, T.R. 2009. Systematics and Diversity of the Cestodes of Elasmobranch Fishes. Presented to the Department of Biology, West Virginia University.

(E). Indicate any other activities that have contributed to effective teaching.

(F). List professional books/papers published during the last five years.

Ruhnke, T. R. and R. E. Workman. 2013. Two new species and a new phyllobothriid cestode genus from sharks of the genus Negaprion Whitley (Carcharhiniformes). Systematic Parasitology 85: 37-48.

Ruhnke, T.R. 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.

Caira, J. N., M. Malek, and T. Ruhnke. 2010 A new genus of Phyllobothriidae (Cestoda: Tetraphyllidea) in carcharhiniform sharks from Iran and Australia. Journal of Helminthology.

Ruhnke, T. R. and H. D. Seaman. 2009. Three new species of Anthocephalum Linton, 1890 (Cestoda: Tetraphyllidea) from dasyatid stingrays of the Gulf of California. Systematic Parasitology 72: 81–95.

Ruhnke, T. R. and J. N. Caira. 2009. Two new species of Anthobothrium van Beneden, 1850 (Tetraphyllidea: Phyllobothriidae) from carcharhinid sharks, with a redescription of Anthobothrium laciniatum Linton, 1890. Systematic Parasitology 72: 217–227.

(G). List externally funded research (grants and contracts) during the last five years.

2010- present WVSU Faculty Coordinator, NSF EPSCoR RII, “Bionanotechnology for Public Security and Environmental Safety”.

2008-present Collaborator – NSF PBI: A survey of the tapeworms (Cestoda: Platyhelminthes) from the vertebrate bowels of the earth. NSF (J.N. Caira P.I.).

2009-present NASA Space Science Research Enhancement Award. Annual Award. Total amount awarded since 1999 approximately $25,000.

2006-2011 Collaborator – NSF BS&I: A Survey of the Elasmobranchs and their Metazoan Parasites of Indonesian Borneo (Kalimantan) (J.N. Caira, P.I.).

A**ppendix II-C: Assessment**

2009 BT Program Assessment Plan, MS Degree

The goal of the Graduate Program in Biotechnology is to develop subject matter knowledge, methodological expertise, communication skills, and critical thinking for students pursuing this degree. Additionally, the Program will provide a technically trained for workforce for the development of a more broadly-diversified workforce for the state of West Virginia and the region. The Master of Science in Biotechnology provides instruction in the diverse disciplines of Biotechnology, as well as specialized training in current concepts and technological advances. The Program prepares students for diverse careers in life science fields such as health care, agri-food, and environmental sciences. The program also includes in-field study for secondary bio-science education teachers.

All students graduating from the Program will take core courses and receive training in fundamental competencies such as molecular biology, environmental monitoring, digital microscopy and image data analysis, statistical analysis and bio-diagnostics. In addition, special competencies may be gained in such areas as chemical and biological environmental technology, waste stream and resource management, aquaculture, modern horticultural techniques, and advanced knowledge and expertise in the biology of plants, animals or microbes.

Methods and Measures of Assessment:

The assessment methods used to ensure a quality graduate education for students and to determine overall achievement of the program's educational objectives include the following elements:

- Subject matter knowledge in key areas: Measurement of this outcome includes students' grades in Biotechnology core courses and thesis advisory committee evaluations of performance in (MS) research defense examinations or the comprehensive exam for MA candidates.

- Methodological expertise in the particular areas of research: Measurement of this outcome includes students' grades in Biotechniques I and II, and Biostatistics. In addition, MS student thesis committee members evaluate methodological expertise at the time of thesis proposal and thesis defense. MA student candidates' methodological expertise is evaluated via the comprehensive exam.

- Communication skills: All graduate students are required to make two seminar presentations in the department's seminar series. The faculty member in charge of the seminar series evaluates the student's presentation. In addition, all Master's degree candidates are required to serve as a teaching assistant for at least two courses. The professor of record for the course evaluates the students' performance. Master of Science candidates' writing skills are assessed both at the thesis proposal stage, the thesis writing plan, and the final thesis. Master of Arts candidates' writing skills are assessed at the comprehensive exam, which is compared to written performance in courses taken.

- Professional development and critical thinking: Measurement of this outcome includes papers published, abstracts submitted, presentations at scientific meetings, performance in industry internships, and the successful defense of the master's thesis. Industry supervisors will provide a written evaluation of students' communication skills, methodological expertise and subject matter knowledge. Alumni surveys will gauge effectiveness of the program in fostering further student development.

Other Assessment Measures in Place:

- Graduate Student Checklist and progress charts: The Director of the Biotechnology Graduate Program periodically (at least once a semester) measures student progress by evaluating plan of study, selection of thesis advisor and/or committee, submission of research proposal, etc. The Director writes letters to the candidates and Thesis Research Advisors regarding student progress. The Director, as advisor for all MA students, communicates with these students directly.

- Faculty Evaluations: Semester course evaluations provide student feedback regarding teaching effectiveness of Faculty and Graduate Teaching Assistants.

Other Assessment Measures in Progress:

- Exit Interviews: Graduate students will be required to participate in an exit interview with the Director shortly before leaving the institution.

- Alumni Surveys: Annual surveys of alumni will be undertaken to gauge the relevance of their educational experience in the Program. These surveys will ask for specific recommendations on changes that should occur to improve the program.

- Employer Surveys: Annual surveys of program graduates' employers will be conducted to gauge the level of satisfaction employers experience from the Biotechnology Graduate Program. Questions relate to current satisfaction as well as desired characteristics of future graduates.

Additional assessment methods and measures include periodic Thesis Committee meetings to appraise student research progress.

Use of Data to Drive Program Decisions

The Director is responsible for compilation of data at the beginning of each academic year and will prepare an annual assessment report. The Biotechnology Graduate Faculty will review the report and make recommendations for action (which may include curriculum or student outcomes revisions) to the director, who will initiate action for improvement.

August 20, 2009

Academic Affairs Assessment of Student Learning Report for Academic Year *2013-2014*
Department/Program Biotechnology MS

Program Learning Outcomes Developed in AY 2010-2011

1. Scientific Method: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.
2. Laboratory Skills: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.
3. Content: Demonstrate an understanding and proficiency in one of the specialized areas of study: Organismal/Environmental or Molecular/Microbial.
4. Scientific Issues: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.
5. Communication Skills: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. Which learning outcomes did you measure this past year? [Please indicate whether any of these measures were conducted as follow-up to a previous year's issues or in response to Program Review. Be specific.]
The previously developed PLOs for the Biotechnology graduate program were never utilized. Five types of assessment were identified in three courses. Three of the assessment types were based on final grades in the courses. The other two assessments were to evaluate written and/or oral communications of an assignment or the MS thesis. While rubrics were developed for these two assessments, who would undertake this component was not determined.

2. In which course(s) were assessments conducted?
None during academic year 2013-2014.

3. How did you assess the learning outcomes(s)? (i.e., method and tool, e.g., rubrics, national norms, item analysis, sampling, student projects, presentations, exams, etc.)
None during academic year 2013-2014.

4. Who analyzed results and how were they analyzed? (Committee, assessment liaison, department faculty, statistical review vs. benchmark, Live Text, etc.)
None during academic year 2013-2014.

5. Summarize results/findings/conclusions. (Data analysis)
None during academic year 2013-2014.

6. What are next steps? (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)
With guidance from the university, the assessment team for the biotechnology program developed new PLOs in the fall of 2014. This plan was unanimously accepted by the graduate faculty in a motion made at a program meeting September 5, 2014. Plans are being made to create the necessary rubrics that will be presented to the graduate faculty at the next meeting (September 19). We plan to share the rubrics with our students to acquaint them with the faculty expectations of successful graduate students. This new plan will allow us to assess students both early and late in the program, to identify gaps in our program and to allow improvements, changes and additions to improve the program.

Appendix III-A: BT Program Enrollment Data, MS Degree

The following are the numbers of Biotechnology Graduate Students seeking MS degrees and numbers MS of graduates, by semester, Summer 2009 through Spring 2014.

Semester	Number of students	Number of graduates
Summer 2009	2	2
Fall 2009	14	1
Spring 2010	14	0
Summer 2010	2	2
Fall 2010	17	0
Spring 2011	19	4
Summer 2011	0	0
Fall 2011	17	0
Spring 2012	20	5
Summer 2012	2	2
Fall 2012	18	4
Spring 2013	18	3
Summer 2013	1	1
Fall 2013	18	1
Spring 2014	19	2
Totals		**27**

Biotechnology Graduate Students do not enroll for classes in the summers, unless they intend to graduate in the summer, in which case they must be enrolled to graduate.

The Biotechnology Graduate Program also awarded two Graduate Certificates in Biotechnology in Spring 2014.

Appendix III-B: Course Enrollment Data

Appendix III-B contains combined data for MS (52 students) and MA (3 students). Data shown are course number, course title, and number of BT students enrolled.

Fall 2009

599	BIOL	SP TOP: MOLECULAR GENETICS	5
640	BIOL	FIELD BOTANY	1
666	BIOL	CANCER BIOLOGY	5
511	BT	BIOTECHNOLOGY SEMINAR	5
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	6
571	BT	TECHNIQUES IN BIOTECH I	6
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	6

Spring 2010

599	BIOL	ST: SEMINAR FOR TEACHING ASST	6
511	BT	BIOTECHNOLOGY SEMINAR	5
555	BT	BIOSTATISTICS	9
572	BT	TECHNIQUES IN BIOTECH II	7
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	7

Summer 2010

592	BT	GRADUATE LIBRARY RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	2

Fall 2010

599	BIOL	SP TOP: DEVELOPMENTAL BIOLOGY	6
599	BIOL	SP TOP: ENTOMOLOGY	1
599	BIOL	SP TOP: PLANT PHYSIOLOGY	5
599	BIOL	ST: EUCARYOTIC MOLECLR GENETCS	4
511	BT	BIOTECHNOLOGY SEMINAR	9
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	12
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
599	BT	ST: SEMINAR FOR TEACHING ASST	5
695	BT	MASTERS THESIS RESEARCH	5

Spring 2011

521	BIOL	ANIMAL PARASITISM	4
565	BIOL	BIOLOGY OF FISHES	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	5
660	BIOL	ENVIRONMENTAL MICROBIOLOGY	3
511	BT	BIOTECHNOLOGY SEMINAR	7

555	BT	BIOSTATISTICS	11
572	BT	TECHNIQUES IN BIOTECH II	9
590	BT	GRADUATE RESEARCH	2
599	BT	SP TOP: SEMINAR FOR TEACHING	3
695	BT	MASTERS THESIS RESEARCH	5

Summer 2011

695	BT	MASTERS THESIS RESEARCH	1

Fall 2011

599	BIOL	SP TOP: GENERAL VIROLOGY	1
640	BIOL	FIELD BOTANY	5
666	BIOL	CANCER BIOLOGY	6
501	BT	TEACHING SEMINAR FOR BIOTECH	5
511	BT	BIOTECHNOLOGY SEMINAR	15
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	10
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	10

Spring 2012

575	BIOL	PRINCIPLES OF AQUACULTURE	2
599	BIOL	SP TOP: IMMUNOLOGY	4
599	BIOL	SP TOP: MICRO SYSTEMS SCIENCE	5
599	BIOL	SP TOP: PHARMACOLOGY	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	3
511	BT	BIOTECHNOLOGY SEMINAR	6
555	BT	BIOSTATISTICS	7
572	BT	TECHNIQUES IN BIOTECH II	10
590	BT	GRADUATE RESEARCH	6
695	BT	MASTERS THESIS RESEARCH	12

Summer 2012

695	BT	MASTERS THESIS RESEARCH	1

Fall 2012

573	BIOL	EUKARYOTIC MOLECULAR GENETICS	8
599	BIOL	SP TOP: DEVELOPMENTAL BIOLOGY	7
599	BIOL	SP TOP: ENTOMOLOGY	1
644	BIOL	PLANT PHYSIOLOGY	2
501	BT	TEACHING SEMINAR FOR BIOTECH	6
511	BT	BIOTECHNOLOGY SEMINAR	7
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	5
571	BT	TECHNIQUES IN BIOTECH I	5
590	BT	GRADUATE RESEARCH	3

695	BT	MASTERS THESIS RESEARCH	11

Spring 2013

510	BIOL	CONSERVATION ECOLOGY	1
521	BIOL	ANIMAL PARASITISM	1
599	BIOL	SP TOP: GENERAL VIROLOGY	2
599	BIOL	ST: CROP EVOLUTION & DIVERSITY	4
501	BT	TEACHING SEMINAR FOR BIOTECH	5
511	BT	BIOTECHNOLOGY SEMINAR	12
555	BT	BIOSTATISTICS	11
572	BT	TECHNIQUES IN BIOTECH II	10
590	BT	GRADUATE RESEARCH	2
695	BT	MASTERS THESIS RESEARCH	8

Summer 2013

591	BT	GRADUATE INDEPENDENT STUDY	1
695	BT	MASTERS THESIS RESEARCH	1

Fall 2013

599	BIOL	SP TOP: PHARMACOLOGY	3
640	BIOL	FIELD BOTANY	1
666	BIOL	CANCER BIOLOGY	7
501	BT	TEACHING SEMINAR FOR BIOTECH	6
511	BT	BIOTECHNOLOGY SEMINAR	14
567	BT	CURR CONCEPTS IN BIOTECHNOLOGY	11
571	BT	TECHNIQUES IN BIOTECH I	11
590	BT	GRADUATE RESEARCH	1
695	BT	MASTERS THESIS RESEARCH	12

Spring 2014

550	BIOL	EVOLUTION	2
561	BIOL	MICROBIAL GENETICS	7
501	BT	TEACHING SEMINAR FOR BIOTECH	3
511	BT	BIOTECHNOLOGY SEMINAR	4
555	BT	BIOSTATISTICS	8
572	BT	TECHNIQUES IN BIOTECH II	8
590	BT	GRADUATE RESEARCH	3
599	BT	SP TOP: SPECTROSCOPIC METHODS	1
695	BT	MASTERS THESIS RESEARCH	12

Appendix III-C: Service Courses

The Biotechnology Graduate Program offered no service courses from Fall 2009 through Spring 2014.

Appendix III-D: Off-Campus Courses

The Biotechnology Graduate Program offered no off-campus courses from Fall 2009 through Spring 2014.

Exhibits

Exhibit A: Mission Statement, Biotechnology Graduate Program

January 24, 2010

The mission of the Biotechnology Program is to provide cross-disciplinary education and training in 21st century concepts and biotechniques to a diverse group of regional, national and international students. The program prepares a cadre of professionals for careers in the diverse industries being revolutionized by Biotechnology and prepares its graduates for advanced education. Through coursework, laboratory work and other academic experiences such as internships, students advance their critical thinking skills, and master the technical skills necessary to solve complex biological problems.

Exhibit B: Biotechnology Graduate Students, MS
Enrolled in the Program at any time from Summer 2009 through Spring 2014

January 17, 2015

advisor	dates	graduated?	where are they now? (job in field, in grad or professional school)
Reddy	fall 11 - fall 13	yes	Ph.D. student Alabama A&M, AL
Padma	fall 11 - spring 13	yes	lab tech at WVSU, WV
Huber	spring 13 - fall 14	yes	student in environmental safety program, Italy
Huber	summer 13	yes	Ph.D. student in plant biochemistry Univ. of Copenhagen
Huber	fall 10 - summer 12	yes	Ph.D. student at Montana State Univ., MT
Reddy	spring 09 - spring 11	yes	employed by an NGO in Nepal
Reddy	fall 10 - fall 12	yes	status unknown
Huber	spring 10 - fall 10	no	(left the program for economic reasons)
Reddy	fall 13 -	not yet	
Collins	fall 12 -	not yet	
Liedl	fall 13 -	not yet	
Hankins	fall 09 - spring 12	yes	Ph.D student in pharmacy at Marshall, WV
Hankins	fall 04 - spring 11	yes	employed as lab tech at Johns Hopkins, MD
Reddy	fall 10 - fall 10	no	(failed out, but due to personal reasons)
Ruhnke	fall 07 - summer 09	yes	employed as licensing agent, WVU, WV
Liedl	spring 14 -	not yet	
Huber	spring 11 - fall 12	yes	employed as lab tech at WVSU, WV
Ruhnke	fall 11 - spring 13	yes	employed in non-science job, OH
Reddy	fall 10 - summer 12	yes	employed as lab tech, OH
Reddy	fall 13 -	not yet	
Collins	spring 12 - spring 12	no	(left the program for financial reasons)
Hankins	fall 11 - spring 13	yes	employed as Instructor at WVSU, WV
Collins	fall 12 -	not yet	
Harris	fall 12 - fall 12	certificate	student in dentistry at WVU, WV
Reddy	fall 07 - summer 09	yes	status unknown
	spring 10 - spring 10	no	(left the program for personal reasons)
Ruhnke	spring 13 - fall 14	yes	employed as lab tech at WVSU, WV
Reddy	spring 14 -	not yet	
Chatfield	fall 13 -	not yet	
Hankins	fall 13 -	not yet	
Eya	fall 11 -	no	(left the program)
	spring 13 - fall 14	no	(failed out)
Hankins	fall 08 - spring 11	yes	Ph.D. student in Biology, University of Virginia, VA

Huber	spring 11 - fall 12	yes	employed as a lab tech at WVSU, WV
Reddy	fall 10 - fall 10	no	(failed out of program)
Harris	fall 09 - spring 11	yes	employed at Serum Institute of India
Eya	fall 12 - fall 14	yes	seeking employment, WV
Harris	fall 09 - spring 12	yes	Ph.D. student Biomed Science at Marshall, WV
Eya	fall 07 - fall 09	yes	employed as Instructor at Bridge Valley CTC, WV
Eya	fall 12 -	not yet	
Hankins	fall 08 - summer 10	yes	Ph.D. student at Marshall, WV
Hankins	fall 11 - spring 14	yes	selling cars, WV
Huber	fall 08 - summer 10	yes	employed as research assistant, Georgetown U., DC
Hankins	fall 12 -	not yet	
Hankins	spring 13 -	not yet	
Harris	spring 10 - spring 12	yes	employed at ATCC, VA
Reddy	fall 10 - spring 12	yes	student at Tuskegee U vet school, AL
Ruhnke	fall 10 - spring 12	yes	employed as lab tech, NC
Eya	fall 10 - fall 12	yes	employed by AEP (non-science), WV
Ruhnke	spring 08 - fall 09	yes	student in Ed D. program, Ohio U., OH
Huber	spring 11 - spring 14	yes	employed as lab tech, NC
Collins	fall 09 - spring 10	no	(took a leave for health reasons)

Exhibit C: Publications from the Biotechnology Graduate Program from Summer 2009 through Spring 2014

Jonathan Eya

1. **Eya, J.C.**, Ashame, M.F. and Pomeroy, C. 2010. Researchers study effect of diet and strain on catfish production. Aquaculture North America, July/August, page 7.
2. **Eya, J.C.**, Ashame, M.F. and Pomeroy, C. 2010. Nutritive evaluation of protein from anaerobically digested poultry wastes as a dietary ingredient replacer for channel catfish, *Ictalurus punctatus*. Journal of World Aquaculture Society 41(S2):179-190.
3. **Eya, J.C.,** Ashame, M.F. and Pomeroy, C. 2010. Influence of diet on mitochondrial complex activity in channel catfish*, Ictalurus punctatus*. North American Journal of Aquaculture 72: 225-236.
4. **Eya, J.C.,** Ashame, M.F. and Pomeroy, C.F. 2011: Association of mitochondrial function with feed efficiency in rainbow trout: Diets and family effects. Aquaculture 321(1-2):71-84.
5. **Eya, J.C.,** Ashame, M.F. Pomeroy, C.F., Manning, B.B. and Brian, B.C. 2012. Genetic variation in feed consumption, growth, nutrient utilization efficiency and mitochondrial function within a farmed population of channel catfish (*Ictalurus punctatus*). Comparative Biochemistry and Physiology Part B 163: 211-220.
6. **Eya, J.C.** Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2013. Effects of dietary lipid levels on growth, feed utilization and mitochondrial function in low- and high- feed efficient families of rainbow trout (*Oncorhynchus mykiss*). Aquaculture 416-417: 119-128.
7. **Eya, J.C.** Nouaga, R.Y., Ashame, M.F., Pomeroy, C.F., Gannam, A.L. 2014. Effects of dietary lipid levels on mitochondrial gene expression in low and high-feed efficient families of rainbow trout (*Oncorhynchus mykiss*). Journal of Fish Biology 84: 1708-1720.

Gerald Hankins

1. Manohar S, Harlow M, Nguyen H, Li J, **Hankins GR**, Park M, Chromatin modifying protein 1A (Chmp1A) of the endosomal sorting complex required for transport (ESCRT)-III family activates ataxia-telangiectasia mutated (ATM) for PanC-1 cell growth inhibition. Cell Cycle 10 (15): 2529-2539, 2011 [PMID: 21705858]
2. Nimmakayala P, Abburi VL, Abburi L, Alaparthi SB, Cantrell R, Park M, Choi D, **Hankins G**, Malkaram S, Reddy UK, Linkage disequilibrium and population structure analysis among *Capsicum annuum* L. cultivars for use in association mapping. Molecular Genetics and Genomics 289 (4): 513-521, 2014 [PMID: 24585251]
3. Reddy UK, Almeida A, Abburi VL, Alaparthi SB, Unselt D, **Hankins GR**, Park M, Choi D, Nimmakayala P, Identification of gene-specific polymorphisms and association with capsaicin pathway metabolites in *Capsicum annuum* L. collections. PLOS One 9: e86393, 2014 [PMID: 24475113]

Robert Harris

1. Gary Hunter and **Robert T. Harris**. Structure and Function of the Muscular, Neuromuscular, Cardiovascular, and Respiratory Systems (chapter 1). In: Essentials of Strength Training and Conditioning. Third edition, Human Kinetics, (R. Earle, ed.) pp. 3-19. (2009)
2. Kevin M. Rice, Sunil K. Kakarla, Sriram P. Mupparaju, Anhaiah Katta, Miaozon Wu, **Robert T. Harris** and Eric R. Blough . Shear stress activates Akt during vascular smooth muscle cell reorientation. Biotechnology and Applied Biochemistry 55: 85-90, 2010
3. Rahul P. Nagmal, James R. Tchabo, Eric R. Blough, **Robert T. Harris**, Resveratrol attenuates fluprostenol induced hypertrophy of vascular smooth muscle cells. Biophysical Journal 98(3) Supplement 1: 4330, 2011.

David Huber

1. Shade, A., Peter, H., Allison, SD, Baho, DL, Berga, M., Burgmann H., **Huber DH**, Langenheder, S., Lennon, JT, Martiny JBH, Matulich KL, Schmidt TM, and Handelsman J. 2012. Fundamentals of microbial community resistance and resilience. Frontiers in Microbiology 3:417. (doi:10.3389/fmicb.2012.00417)
2. Alvarado A, Nafarrate E, **Huber D**, Balagurusamy N (2012) Microbiología de la digestión anaerobia. In Balagurusamy N, Das KC (ed), Avances Tecnologicos en la Produccion de Biogas: Perspectives y Retos. Lap Lambert Academic Publishing, Saarbrücken, Germany.
3. Sharma, D., Espinosa-Solares, T., **Huber, DH**. 2013. Thermophilic anaerobic co-digestion of poultry litter and thin stillage. Bioresource Technology. 136:251-256.

4. Smith, A.M., Sharma, D., Lappin-Scott, H., Burton, S., **Huber, D.H.** 2014. Microbial community structure of a pilot-scale thermophilic anaerobic digester treating poultry litter. Applied Microbiology and Biotechnology 98(5):2321-2334. (doi 10.1007/s00253-013-5144-y).
5. Rivera-Salvador, V., I.L. Lopez-Cruz, T. Espinosa-Solares, J.S. Aranda-Barradas, D**.H. Huber**, D. Sharma, J.U. Toledo. 2014. Application of Anaerobic Digestion Model No. 1 to describe the syntrophic acetate oxidation of poultry litter in thermophilic anaerobic digestion. Bioresource Technology 167:495-502.

Umesh Reddy

1. Nimmakayala P, Tomason Y, Jeong J, Vajja G, Levi A, Gibson P, **UK. Reddy**.2009. Molecular diversity in the Ukrainian melon collection as revealed by AFLPs and microsatellites. Plant Genetic Resources 7: 127-134.
2. Nimmakayala P, Jeong J, Tomason Y, Levi A, Ramasamy P, **UK. Reddy**.2010. Genetic reticulation and interrelationships among *Citrullus* species as revealed by joint analysis of shared AFLPs and species-specific SSR alleles. Plant Genetic Resources 8 (1): 16-25.
3. Nimmakayala P, Faridi NI, Tomason YR, Lutz F, Levi A and **U K. Reddy**. 2011. Citrullus. (Book chapter). Wild Crop Relatives: Genomic and Breeding Resources, Vegetables. Springer-Verlag, Berlin Heidelberg. Pages 59-66.
4. **Reddy UK**, Rong JK, Nimmakayala P, Vajja G, Rahman M, Yu JZ, Soliman K, Heller-Uszynska K, Kilian A, and Paterson A.H. 2011. Use of DArT markers for integration into cotton reference map and anchoring to a RIL map. Genome 54(5): 349-359.
5. Guru J, Nimmakayala P, Zheng Y, Gouda K, **Reddy U** and Sunkar R. 2012. Characterization of the small RNA component of the transcriptome in leaves and fruits of four cucurbits revealed dynamic regulation of conserved and novel miRNAs. BMC Genomics, 13:329.
6. Dawei Li, Jordi Garcia-Mas, Juan Zalapa, Jack E Staub, **Umesh K. Reddy**, Xiaoming He, Zhenhui Gong, Yiqun Weng 2011. Syntenic Relationships between Cucumber (Cucumis sativus L.) and Melon (C. melo L.) chromosomes as revealed by comparative genetic mapping. BMC Genomics 2011, 12:396
7. Manohar S., Jagadeeswaran G., Nimmakayala P., Tomason Y., Almeida A., Sunkar R., Levi A., **Reddy UK**. (2012) Dynamic regulation of novel and conserved miRNAs across various tissues of diverse Cucurbit species. Plant Mol. Biol. Rep ;31 335-343
8. Levi A, Thies J A, Wechter P, Harrison HF, Simmons AM, **Reddy UK**, Nimmakayala P, and Fei Z. 2013. High frequency oligonucleotides: targeting active gene (HFO-TAG) markers revealed wide genetic diversity among *Citrullus* spp. accessions useful for enhancing disease or pest resistance in watermelon cultivars. Genet Resour and Crop Evol, 60, 427-440.
9. Tomason Y, Nimmakayala P, Levi A and **Reddy U**.2013. Map-based molecular diversity, linkage disequilibrium and association mapping of fruit traits in melon. Mol Breeding (doi:10.1007/s11032-013-9837-9).
10. Paterson AH, Wendel JF, Gundlach H, Guo H, Jenkins J, Jin D, Llewellyn D, Showmaker KC, Shu S, Udall J, Umesh K. Reddy et al 2012. The cotton genomes, their polyploidies, and the evolution of spinnable fibers. Nature. DOI:10.1038/nature11798
11. Nimmakayala P, Vajja G, Gist R, Tomason YR, Levi A, **Reddy UK**.2011. Effect of DNA methylation on molecular diversity of watermelon heirlooms and stability of methylation specific polymorphisms across the genealogies. Euphytica. 177: 79-89.
12. Hussain, A. J., Ali, J., Siddiq, E. A., Gupta, V. S., **Reddy, U. K**., and Ranjekar, P. K. (2012) Mapping of tms8 gene for temperature-sensitive genic male sterility (TGMS) in rice (Oryza sativa L.), Plant Breeding 131, 42-47.
13. Levi A, Thies J A, Wechter P, Harrison HF, Simmons AM, **Reddy UK**, Nimmakayala P, and Fei Z. 2013. High frequency oligonucleotides: targeting active gene (HFO-TAG) markers revealed wide genetic diversity among *Citrullus* spp. accessions useful for enhancing disease or pest resistance in watermelon cultivars. Genet Resour and Crop Evol, 60, 427-440.
14. **Umesh K. Reddy**, Nischit Aryal, Nurul Islam-Faridi, Yan Tomason, Amnon Levi and Padma Nimmakayala. 2013. Cytomolecular characterization of rDNA distribution in various *Citrullus* species using fluorescent in situ hybridization. Genetic Resources and Crop Evolution. DOI 10.1007/s10722-013-9976-1.

15. Djanaguiraman M, Vara Prasad PV, Murugan M, Perumal R, **Reddy UK** (2014) Physiological differences among sorghum (*Sorghum bicolor* L. Moench) genotypes under high temperature stress. Environmental and Experimental Botany 100, 43-54.
16. Tomason Y, Nimmakayala P, Levi A and **Reddy UK**. 2013. Map-based molecular diversity, linkage disequilibrium and association mapping of fruit traits in melon. Mol Breeding, 31(4): 829-841 (doi: 10.1007/s11032-013-9837-9).
17. **Reddy, U. K**., A. Almeida, V. L. Abburi, S. B. Alaparthi, Nimmakayala P et al., 2014. Identification of Gene-Specific Polymorphisms and Association with Capsaicin Pathway Metabolites in *Capsicum annuum* L Collections. PLoS ONE 9: e86393.
18. Nimmakayala, P., Abburi VL, Abhishek Bhandari, Lavanya Abburi, Venkata Gopinath Vajja, Rishi Reddy, Sridhar Malkaram, Pegadaraju Venkatramana, Asela Wijeratne, Yan. R. Tomason, Amnon Levi, Todd C. Wehner, and **Reddy UK**. 2014. Use of VeraCode 384-plex assays for watermelon diversity analysis and integrated genetic map of watermelon with single nucleotide polymorphisms and simple sequence repeats. Molecular Breeding, DOI 10.1007/s11032-014-0056-9.
19. Nimmakayala, P., Venkata l. Abburi, Lavanya Abburi, Suresh Babu Alaparthi, Robert Cantrell, Minkyu Park, Doil Choi, Gerald Hankins, Sridhar Malkaram and **Reddy UK**. 2014. Linkage disequilibrium and population structure analysis among *Capsicum annuum* L. cultivars for use in association mapping. Molecular Genetics and Genomics, DOI 10.1007/s00438-014-0827-3.
20. **Reddy UK**, Nimmikayala P, Levi A, Abburi VL, Saminathan T, Tomason YR, Vajja G, Reddy R, Abburi L, Wehner TC, Ronin Y, Karol A. 2014 High-Resolution Genetic Map for Understanding the Effect of Genome-Wide Recombination Rate on Nucleotide Diversity in Watermelon. G3: Genes|Genomes|Genetics. doi: 10.1534/g3.114.012815.
21. Padma Nimmakayala, Amnon Levi, Lavanya Abburi, Venkata Lakshmi Abburi, Yan R. Tomason, Thangasamy Saminathan, Venkata Gopinath Vajja, Sridhar Malkaram, Rishi Reddy, Todd C. Wehner, and **Umesh K. Reddy** 2014. Single nucleotide polymorphisms generated by genotyping by sequencing used to characterize genome-wide diversity, linkage disequilibrium and selection sweep for worldwide cultivated watermelon. BMC Genomics 2014, 15:767 (Highly accessed)

Timothy Ruhnke

1. **Ruhnke, T. R.** and R. E. Workman. 2013. Two new species and a new phyllobothriid cestode genus from sharks of the genus *Negaprion* Whitley (Carcharhiniformes). Systematic Parasitology 85: 37-48.
2. **Ruhnke, T.R.** 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.
   Caira, J. N., M. Malek, and **T. Ruhnke**. 2010 A new genus of Phyllobothriidae (Cestoda: Tetraphyllidea) in carcharhiniform sharks from Iran and Australia. Journal of Helminthology. 85: 40-50.
3. **Ruhnke, T. R.** and H. D. Seaman. 2009. Three new species of *Anthocephalum* Linton, 1890 (Cestoda: Tetraphyllidea) from dasyatid stingrays of the Gulf of California. Systematic Parasitology 72: 81–95.
4. **Ruhnke, T. R.** and J. N. Caira. 2009. Two new species of *Anthobothrium* van Beneden, 1850 (Tetraphyllidea: Phyllobothriidae) from carcharhinid sharks, with a redescription of *Anthobothrium laciniatum* Linton, 1890. Systematic Parasitology 72: 217–227.
5. 2010- present. WVSU Faculty Coordinator, NSF EPSCoR RII, "Bionanotechnology for Public Security and Environmental Safety".
6. 2008-2014. Collaborator – NSF PBI: A survey of the tapeworms (Cestoda: Platyhelminthes) from the vertebrate bowels of the earth. NSF (J.N. Caira P.I.).
7. **Ruhnke, TR**, Caira, JN and Cox, A. 2015. The cestode order Rhinebothriidea no longer family-less: A molecular phylogenetic investigation with erection of two new families and description of eight new species of *Anthocephalum*. Zootaxa 3904: 51–81.
8. **Ruhnke, T.R**. 2011 A monograph on the Phyllobothriidae. Bulletin of the University of Nebraska State Museum, 25: 1-208.

Barbara Liedl

1. **Liedl, B.E**., J.A. Labate, J.R. Stommel, A. Slade and C. Kole (eds). (2013). Genetics Genomics and Breeding of Tomato. Genetics, Genomics and Breeding Series, Boca Raton, FL: CRC Press.
2. Anderson, N.O., S. Poppe, P.D. Ascher, E. Gesick, S. Yao, D. Wildung, P. Johnson, V. Fritz, J. Hebal, L. Klossner, N. Eash, **B.E. Liedl**, and J. Reith-Rozell. (2012). Mammoth™ 'Yellow Quill' Garden Chrysanthemum. HortScience 47(2):285-288.
3. Anderson, N., L. Klossner, N. Eash, V. Fritz, M. Wang, S. Poppe, J. Reith-Rozell, D. Wildung, S. Yao, P. Johnson, and **B. E. Liedl**. (2008). *Gaura lindheimeri* 'Snowstorm': A new Z6 Heat/frost-tolerant Container and Landscaping Perennial. HortScience 44(5): 1481-1483

Exhibit D: Grants Awarded to Faculty of the Biotechnology Graduate Program Awarded from Summer 2009 through Spring 2014

Date	Project	Agency	Amount	Faculty or Researcher
2009	Bioplex 9	USDA	$453,175	Huber
2009	Organic Seeds / sub	USDA	$ 9,004	Liedl
2009	INBRE-Harris	NIH	$683,000	Harris
2009	EPSCoR Track 1 Supplemental	NSF	$ 86,832	Ruhnke, et. al*
2009	EPSCoR CI-TRAIN	NSF	$581,890	Toledo, Reddy
2009	SURE	HEPC	$ 60,060	Harper
2010	Tomato Blight	USDA	$ 9,004	Liedl
2010	WV-INBRE	NIH	$ 9,000	Harris
2010	NE SARE	USDA	$ 15,000	Liedl
2010	WVDA – Specialty Crop	USDA	$ 6,882	Liedl
2010	Bioplex II	USDA	$468,000	Huber, Toledo
2010	SURE 2010	HEPC	$ 30,000	Harper
2010	INBRE	NIH	$172,525	Hankins
2010	INBRE	NIH	$173,793	Harris
2010	CBG – Crop Evolution	USDA	$299,986	Padma Nimmakayala
2010	CBG – Value Added Peppers	USDA	$299,937	Hankins
2010	CBG – Microbial Communities	USDA	$564,000	Huber
2010	EPSCoR RII Bionanotech	NSF	$500,000	Ruhnke, et. al*
2011	NE-SARE WV Outreach	USDA	$ 15,000	Liedl
2011	INBRE - MU	NIH	$ 24,760	Hankins
2011	EPSCoR RII Bionanotech yr. 2	NSF	$490,000	Ruhnke, et. al*
2011	CBG - Trout	USDA	$295,663	Eya
2011	Sol. CAP Yr. 3, Mich. State sub	USDA	$ 6,250	Liedl
2012	INBRE	NIH	$174,476	Hankins
2012	INBRE	NIH	$ 17,700	Hankins
2012	CBG - Teaching	USDA	$149,583	Harris, Reddy, Ford
2012	CBG - CGIAR	USDA	$299,811	Reddy, Chatfield, Padma
2012	CBG - Tomatoes	USDA	$299,734	Liedl
2012	CBG - Pumpkins	USDA	$299,832	Padma, Reddy, Harris
2012	EPSCoR RII Bionanotech yr. 3	NSF	$485,000	Ruhnke, et. al*
2012	Step To Success	NSF	$499,248	Byers, Harper
2012	CBG - Mine Sites	USDA	$242,954	Huber, Reddy, Barry, Hass
2013	CBG Alcorn St. Sub	USDA	$293,497	Padma, Reddy
2013	EPSCoR mentoring Sub	NSF	$ 10,000	Hankins
2013	CBG – Hibiscus 2 Sub	USDA	$ 50,000	Hankins
2013	INBRE Summer teacher	NIH	$ 20,000	Hankins
2013	INBRE	NIH	$174,530	Hankins
2013	EPSCoR RII Bionanotech yr. 4	NSF	$485,000	Ruhnke, et. al*
2013	CBG - Watermelon	USDA	$444,346	Reddy
2013	CBG – Plant Breeding	USDA	$120,000	Padma, Reddy
2013	Farmer Outreach	USDA	$ 4,996	Liedl
2014	INBRE Nat. Products	NIH	$ 26,560	Harris
2014	SURE 2014	HEPC	$ 76,000	Harper
2014	Instrumentation - Analyzer	DOD	$156,336	Eya
2014	INBRE Equipment	NIH	$ 72,091	Hankins
2014	CBG – Mushrooms - sub	USDA	$ 22,370	Hankins **= $9,556,094**

Exhibit E: Response from the 2009 Program Review of the Biotechnology Graduate Program

ACADEMIC PROGRAM REVIEW

2009-10

Institutional Response Form

Program: Master of Science and Master of Arts in Biotechnology **Date:** May 28, 2010

Type of Review: X Comprehensive Self-Study
Follow-Up / Progress Report

Recommendation to the Board of Governors:

X **1.** Continuation of the program at the current level of activity with specific action as described in the Rationale section of this Form;

2. Continuation of the program at a reduced level of activity (e.g., reducing the range of optional tracks, merging programs, etc.) or other corrective action as described in the Rationale section;

3. Identification of the program for further development (e.g., providing additional institutional commitment);

4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;

5. Discontinuance of the Program according the provisions of Higher Education Policy Commission (Section 8.1, Series 11, Title 133)

6. Other. Specify.

Rationale for Recommendation:

The Committee recommends the Master in Biotechnology programs be continued at the current level of activity with specific action. The committee commends the program for almost full implementation of program offerings and production of sixteen graduates during the review period. Strengths of the program include the productive faculty with substantial grant funded research and collaboration with other institutions of higher education. Additional strengths include mentoring of graduate students and graduates who are employed in their major field or have gained admittance to other graduate/professional programs. The weaknesses of the program include no assessment plan (and therefore, no data), limited space and limited administrative support.

Therefore the Committee recommends specific action that a follow-up report due January 2012, with a detailed and viable assessment plan with evidence of implementation including data collection

I concur with the recommendation of the Program Review Committee.

R. Charles Bryan
Signature of Chief Academic Officer

May 28, 2010
Date

Hazo W. Carter
Signature of President

6-11-10
Date

Exhibit F: Plan of Correction Resulting from the 2009 Program Review of the Biotechnology Graduate Program

The Biology Department has several, related weak links in an otherwise strong chain. We lack program-level assessment, we have no organized system for keeping track of our alumni, our outreach and recruitment are piecemeal-to-neglected, and we don't publicize. More personnel would solve all these problems, but the plan adopted by the Biology Faculty is as lean as can be and still succeed.

In this plan, all departmental weakness are addressed can be handled by two committees (each with a Chair who has the resources to do the job), a Graduate Outreach Assistant (20 hours per week), and a vibrant, interactive web page.

This Plan of Correction was formally approved by the Biology Department Faculty at our meeting of November 13, 2009. Draft minutes are included here.

Committee on Expectation, Standards, Assessment:

Why: The CESA helps the Biology Department / Biotechnology Graduate Program fulfill its Mission through review / deliberation / recommendation / assistance in improvement.

Who: CESA Chair (a member of the Biology Faculty); Biology Faculty rep(s), Biology Chair, NSM Faculty rep, WVSU Faculty rep, Biology Student rep, Biotech Grad Student rep (GSA rep), alum + employer rep(s), invited guests.

Tasks: compare the Department's Mission with its performance, write / grade / review Freshman and Senior Standards Exams, review Annual Report, review Student Polls, review Employer Surveys, review any appropriate Departmental info, participate in Biology Department / Biotech outreach, post to The Lobby, make any recommendations to Biology Chair, set its own operating rules

Operations: This is a deliberative body which oversees the long-term ability of the Department to achieve its mission. It meets as needed, meets at least once a semester, monitors The Lobby, certain members (ex. student member) may be excluded from specific tasks, may ask Biology Chair for any appropriate info (etc.), typically Biology Chair provides data summaries (unless committee asks for raw data), CESA subordinate to nobody and may talk to anybody (ethical and personnel issues being considered), primary contact with Biology Department / NSM / WVSU is Biology Chair, reports / minutes go in Biology Department Annual Report, CESA Chair has 1/3 release time

Committee on Departmental Relations:

Why: The CDR helps the Biology Department / Biotechnology Graduate Program fulfill its Mission by gathering and sharing info and views throughout the Department, alumni, employers / involving all members of the Department in discussion / helping the Department improve.

Who: CDR Chair (a member of the Biology Faculty); NSM Secretary, NSM Financial, Biology Chair, Biotech rep (Chair Graduate Admission Committee), Biology Student reps (2; DNA Club), Biotech Grad Student reps (GSA rep and GOA), Biology Faculty reps (2), NSM rep, invited guests

Tasks: daily posting and upkeep of The Lobby (web page), web site upkeep, alumni contact and records, department open house held each semester, outreach to local public schools, PR (ex. write articles to newspapers), recruitment, other social events, review results of polling from The Lobby, make any recommendations

operations: meets as needed, meets at least once a month, individual committee members volunteer to do specific tasks, primary contact with Biology Department / NSM / WVSU is Biology Chair, CDR Chair has 1/3 release time

New items in this plan:

- A Biology Department Committee on Expectations, Standards and Assessment
- A Biology Department Committee on Departmental Relations
- A Graduate Outreach Assistant (20-hour paid assistantship devoted to these tasks, tuition waiver)
- "The Lobby" webpage (This is no small part of the plan. It will be the hub of announcements, departmental info, events, camaraderie, feedback, polling, etc. Picture a newspaper's web page)
- Regular / ongoing polling of students, alumni, employers on The Lobby (subsumes Electives Surveys, Employer Surveys, etc.)
- Release time for CDR Chair and CESA Chair (1/3 each) or paid overload
- Freshman Biology Standards Exam (done in NSM 101) and a Senior Biology Standards Exams (done in Biol 411). We can either write our own or find a national standard test.
- Database of alum: data entered by Administrative Secretary, technical support by Chair CDR (or designee), coordination with WVSU Alumni Relations, data continually updated, frequent contact through The Lobby, yearly contact through US mail, Faculty send alumni info to Administrative Secretary for entry into database
- Regular (each semester) department open houses or other activities (tour, seminars, fac vs. students competitions, dinners)

Specific, long-term tasks:

CESA: will be set up in spring 2010, continue forever, cover its tasks, the CESA Chair should expect to work 5+ hours per week

CDR: will be set up in spring 2010, continue forever, cover its tasks, the CESA Chair should expect to work 5+ hours per week

GOA: Faculty will find, recruit, train as needed, Biology Chair (as Director of the Biotechnology Graduate Program) will supervise, mentor

alumni contact data base: will be set up in Fall 2009, maintained by Chair of CDR, updated whenever anyone gets alumni info and sends it to Chair of CDR

Freshman and Senior Standards Exams: will be developed and implemented in spring 2010, administered each semester in Biol 411, updated by CESA as needed

The Lobby: will be implemented in spring 2010 (pending approvals), only designated Faculty and Staff may post directly, anyone may post as approved by designated Faculty (Chair CDR or designee), GOA, CDR rep and Computer Services do technical support, daily updates, regular polling of students, alumni, employers (replaces the current Electives Survey instrument, used for Employer Survey, etc.)

Exhibit G: **Graduate Student Manual** *April 8, 2014*
Biotechnology Graduate Program
West Virginia State University

Academic Year 2013 - 2014

Table of Contents **Page**

This manual is intended for Graduate Students and Faculty in the Biotechnology Graduate Program at West Virginia State University. It is an un-official guide to procedures and policies; it is not a contract, nor does it replace or supersede WVSU regulations.

1. Program Introduction and Overview

The West Virginia State University Biotechnology Graduate Program offers two degrees: a Master of Science in Biotechnology (with student research culminating in a thesis) and a Master of Arts in Biotechnology (coursework only). At this time, we offer no doctoral program.

In Fall 2003, the Department of Biology at West Virginia State College launched a graduate program in Biotechnology. The Biotechnology Graduate Program at WVSU is a unique program in the life sciences that emphasizes skills that a 21st century biologist will need. The goal of the Master's Degree Program in Biotechnology is to provide instruction in the broad field of biotechnology, as well as specialized training in the current concepts and technological advances of sub-disciplines of biotechnology. Students learn state-of-the-art biotechnology and use acquired techniques to conduct research that addresses environmental, agricultural and biomedical issues. In addition, our affiliation with the Research Scientists of the Gus R. Douglass Institute for Land Grant Research provides opportunities to choose from a surprisingly diverse variety of research projects.

The Biotechnology Graduate Program is physically and administratively housed within the WVSU Department of Biology.

Curriculum for Master of Biotechnology Degrees (MS and MA)

Successful completion of the Biotechnology Graduate program leads to either a Master's of Science in Biotechnology or a Master of Arts in Biotechnology. The M.S. component of the program prepares students for continued graduate education in an area of the life sciences or diverse careers in the Biotechnology, Pharmaceutical, and Environmental Sciences; and Health Care industries. The M.S. track requires the development and completion of an independent research project. Secondary Education professionals can also take advantage of the program by pursuing an M.A. (non-thesis) in Biotechnology. This track allows students to choose from a variety of elective courses to meet program requirements.

We divide the broad field(s) of Biotechnology into two areas of concentration: Organismal / Environmental and Molecular / Microbial. Biotechnology education is built on five core courses: Current Concepts in Biotechnology (lecture), two semesters of Techniques in Biotechnology (lab), Biostatistics, and Biotechnology Seminar. All students teach two sections of undergraduate courses.

The MS Degree continues with four electives in your chosen area of concentration, plus research, writing, defense, and public presentation of your own Master's Degree thesis work.

The MA degree continues with six electives in your chosen area of concentration, plus a comprehensive exam covering your Master's coursework. A graduate student who is unable to enter a lab (and therefore cannot earn a MS degree) may opt to pursue an MA degree instead.

Graduate Certificate in Biotechnology

The WVSU Biotechnology Graduate Program offers a Graduate Certificate in Biotechnology. This 12-credit, coursework-based (i.e. no research or thesis requirements) certification is especially intended for public school teachers who wish to update their knowledge of current Biotechnology and get their certification renewed. The Certificate consists of the core courses of the Program. Details are given in Appendix K, page 36. Contact Biotechnology Program Coordinator Dr. Richard Ford if you would like to discuss details such as when classes will be offered. And if you would like to speak with the faculty who teach these courses, or if you would like to sit in on a class, etc., let's talk. To apply, contact the Registrar, Ms. Donna Hunter, hunterdl@wvstateu.edu, 304-766-4146.

Program Contact Information

Administrative Secretary	Ms. Glenna Curry	304-766-3102	gcurry4@wvstateu.edu
Academic Program Associate	Ms. Audrana Austin	304-766-5778	aaustin1@wvstateu.edu
Assistant to the Dean of NSM	Ms. Allison Meadows	304-766-3132	acox5@wvstateu.edu
Biotech Program Coordinator	Dr. Richard Ford	304-766-5742	fordri@wvstateu.edu
Dean, College of Natural Sciences and Math	Dr. Katherine Harper	304-766-3142	harperkl@wvstateu.edu
Program web site	http://www.wvstateu.edu/Academics/Colleges/College-of-Natural-Sciences-and-Mathematics/Biotechnology-(1).aspx		
Program mailing address	101 Hamblin Hall West Virginia State University PO Box 1000 Institute, WV 25112-1000		
Program fax	304-766-5244		

Biotechnology Graduate Faculty and their research programs

Dr. Kevin Barry — Ecology of invasive plants **kbarry@wvstateu.edu**

Dr. Mark Chatfield — Plant Physiology, Microbiology, Molecular Biology **chatfield@wvstateu.edu**
Dr. Chatfield's lab is interested in the interaction between microflora of the soil and trees, particularly with respect to reclamation of strip mines.

Dr. Sean Collins — Social Insect Biology, Insect Population Biology, Ecology **scollin5@wvstateu.edu**
Dr. Collins' lab uses molecular approaches to define population distributions of social wasps.

Dr. Jonathan Eya — Fish Biology and Nutrition, Aquaculture, Nutrigenomics, Nutritional Immunology **eyajc@wvstateu.edu**
Dr. Eya's lab is interested in applied aquaculture, and is currently exploring mitochondrial gene expression relative to nutrition.

Dr. Richard Ford — Principles of Biology, Fundamentals of Biology, Microbiology **fordri@wvstateu.edu**

Dr. Gerald Hankins — Tumor Biology, Gene Therapy **ghankins@wvstateu.edu**
Dr. Hankins' lab studies aspects of meningioma biology, including gene therapy and the effects of exogenous chemicals (ex. progesterone) on gene expression.

Dr. Katherine Harper — Dean of the College of Natural Sciences and Mathematics.
Genetics, Cell Biology, Virology **harperkl@wvstateu.edu**

Dr. Rob Harris — Muscle Physiology **harrisro@wvstateu.edu**
Dr. Harris studies the response of smooth muscle cytoskeletal response to stimuli such as mechanical stress and nutritional chemicals (ex. resveratrol).

Dr. David Huber — Environmental Microbiology, Environmental Microbial Genomics, Microbial Diversity, Biofilms, Anaerobic Digestion **huberdh@wvstateu.edu**
Dr. Huber's lab uses molecular approaches to characterize the identity and function of microbial communities in poultry waste treated in a thermophilic anaerobic digester.

Dr. Barbara Liedl	Associate Research Professor. Plant Breeding and Genetics, Horticulture, Plant Reproductive Barriers, Speciation, Sustainable Agriculture **liedlbe@wvstateu.edu** *Dr. Liedl's lab is developing insect and disease resistant tomato varieties for greenhouse and high tunnel production using marker assisted selection. Her lab also works on reproductive barriers between cultivated tomato and their wild species to assist in transfer of resistance traits. Additional research includes variety trials and sustainable agriculture production methods for small producers.*
Dr. Padma Nimmakayala	Research Scientist and Assistant Professor: Quantitative Genetics, DNA marker-assisted plant breeding **padma@wvstateu.edu** *Dr. Nimmakayala's research focuses on molecular marker development, genetic and physical mapping, marker assisted selection in vegetable crops (pepper, watermelon, sweetpotato and other cucurbits).*
Dr. Umesh Reddy	Plant Genomics, Biotechnology **ureddy@wvstateu.edu** *Dr. Reddy's lab specializes in genomics of significant traits in commercially important plants, including cotton, peppers, melons.*
Dr. Tim Ruhnke	Systematics and Evolution of Parasitic Platyhelminths, Environmental Parasitology **ruhnketr@wvstateu.edu** *Dr. Ruhnke studies the phylogeny and evolution of tapeworms in sharks and rays, using both traditional phenotypic characterization as well as molecular (rDNA) approaches.*

2. How to Apply to the Program

The WVSU Biotech Program accepts applicants twice a year: at the start of the Fall semester (typically in mid-August) and at the start of the Spring semester (typically in mid-January). See the WVSU Biotech web site for upcoming deadlines dates. We accept all qualified applicants. However, we can fund only a limited number of assistantships.

What's the process?

Send us your completed application. Consult the Application Checklist (Appendix A). Do this by the due date.

If you want to know if we have received your application materials, contact

1. Ms. Allison Meadows, Assistant to the Dean of NSM acox5@wvstateu.edu 304-766-3132
2. Ms. Audrana Austin, Academic Program Associate aaustin1@wvstateu.edu 304-766-5778

Soon after the deadline date, the WVSU Biotech Faculty meet and review all applications. We determine how many GTAs and GRAs will be available for incoming students. Then we make our best decisions from among the applicants. We rarely make decisions before the application deadline date has passed, but we wouldn't rule it out for an exceptional applicant.

We will contact you, regardless of the decision. We will inform you (both via email and on official WVSU stationary) if you have been accepted into the Program and if you have been offered an assistantship. Details such as the amount of the stipend, starting dates for classes, necessary paperwork, etc. will be provided in the notification letter.

If you accept, you must let us know (see Appendix E: Letter of Intent). Contact Ms. Austin.

What can an applicant do to be most competitive?

Begin the application process early. Allow plenty of time for lost documents, slow references, complicated visa arrangements, etc. Be proactive in ensuring that your application is complete (see Application Checklist, Appendix A). An incomplete application may not disqualify you, but it significantly hurts your chances. We get good applicants to choose from.

Contact research faculty members. Find out if there is a faculty member you want to work with, and if that faculty member will accept you into his/her laboratory. All things being equal, a candidate who has already been accepted into a research lab will beat one who has not. Remember: acceptance into the Program does not guarantee acceptance into a research lab.

Although we will consider any applicant with a "strong background in biological sciences and physical sciences", we are especially interested in applicants who already possess basic lab skills, and who have an up-to-date knowledge of genetics, molecular biology, biochemistry and physiology.

Good English is a must! You must be able to communicate, both verbally and orally, in reasonably-correct, understandable English. All classroom instruction is in English, your thesis will be in English, and all Biotech Graduate students must teach at least two sections as a GTA. So you must demonstrate to us that your English is solid.

3. Graduate Teaching Assistantships and Graduate Research Assistantships

Policies

Almost all WVSU Biotech graduate students are supported by either a Graduate Teaching Assistantship (GTA) or a Graduate Research Assistantship (GRA). In AY 2013-2014, we have 10 GTA positions and 10 GRA positions. Our GTAs teach half-time, which (for a team of two GTAs) means four sections of teaching labs (eight teaching hours, plus 12 hours of preparatory time) per week. Our GRAs are also half-time (20 hours per week), and the nature of each GRA varies with the particular lab in which the GRA works.

Graduate Assistantships include full tuition coverage and stipends of $12,000 per academic year. Currently, there are about $400 per year of fees that are not covered by WVSU; however, the Program often has ways to help.

The Biotech faculty expect that most graduate students will complete their degree in two years. Although we do not guarantee support for two years, we make every effort to do so, provided the student is making acceptable progress through the Program.

Graduate Assistantships are awarded to students without regard to financial status, race, sex, age, color, religion, disability, national origin or ethnic origin. In order to be eligible for assistantships, you must be enrolled full-time (9 credit hours).

Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen. See Section 6 of this Manual for these deadlines.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Office assignments are made at the discretion of the Coordinator, in space made available by the Dean. Graduate students should not need to be told that, in all locations in Hamblin Hall, they are expected to behave as professional academics and scientists. As office space in Hamblin Hall is limited, priority for offices will be given to GTAs over GRAs. Mailboxes are provided in the main Biology office, Hamblin Hall room 101. Be sure to check them regularly, even daily.

Graduate Teaching Assistantship (GTA) awardees are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters, not counting summers.

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught. In addition, The Coordinator and Dr. Kevin Barry will observe teaching by new GTAs, as well as any other GTAs who bear further observation. Graduate Teaching Assistantships are awarded on a single-semester basis, but are renewable.

Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). Renewal of the GTA is contingent upon acceptable performance (see Appendix I, Renewal / Continuation of Graduate Teaching Assistantship).

GTAs are permitted to purchase Faculty / Staff parking permits.

Graduate Research Assistantships (GRA) are available through various funding sources. Some Biotechnology Graduate Faculty are able to employ GRAs through their individual grants monies. For details, contact the faculty member who sponsors the assistantship.

Several GRAs are available to support researchers who work with the Gus. R. Douglass Institute (GRDI). Recipients of these "Evans Allen / GRDI" GRAs are recommended by the individual researcher, nominated by the Biotechnology Graduate Faculty, and selected by the Douglass Institute. The Douglass Institute first notifies the Biotechnology Faculty of the number of funded GRA positions. The Faculty subsequently provide the Douglass Institute administrators with a ranked list of candidates. This ranking is based on such factors as the academic preparedness of the candidates and a fair distribution of GRA positions among eligible labs. The Douglass Institute notifies the Coordinator of the awardees.

Graduate Research Assistantships are awarded on a single-semester basis, but are renewable.

GRAs are not issued Faculty / Staff parking permits.

Procedures for Getting a Graduate Teaching Assistantship

The Graduate Teaching Assistant (GTA) should see Mrs. Audrana Austin (Academic Program Associate) to complete this process. A new application must be completed each semester.

Ms. Austin will help you prepare a "Letter of Intent" each semester. Ms. Austin will guide you through all necessary paperwork.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Note that some GTAs receive actual tuition waivers, while others have their tuition paid by other mechanisms / funding sources (ex. Academic Affairs). Although we tend to refer to all of these as "tuition waivers", the term is not accurate for most GTAs.

Procedures for Getting a Graduate Research Assistantship

The Graduate Research Assistant (GRA) should see Mrs. Audrana Austin (Academic Program Associate) to complete this process. A new application must be completed each semester.

Ms. Austin will help you prepare a "Letter of Intent" each semester. Ms. Austin will guide you through all necessary paperwork.

New foreign students, be advised that you cannot be employed or paid until you have a Social Security number. You cannot apply for one until you have been in the US for ten days, and you should allow time for the application to be processed.

Note that some GRAs receive actual tuition waivers, while others have their tuition paid by other mechanisms / funding sources (ex. Academic Affairs). Although we tend to refer to all of these as "tuition waivers", the term is not accurate for most GRAs.

4. Program Requirements

Biotechnology Program Core classes 12 credits of Core classes:

BT 511	Biotechnology Seminar	2 credits total (1 credit for each of two semesters)
BT 555	Statistics	3 credits
BT 567	Current Concepts in Biotechnology	3 credits
BT 571	Techniques in Biotechnology I	2 credits
BT 572	Techniques in Biotechnology II	2 credits

Biotechnology Program areas of concentration

Organismal / Environmental

Choose elective courses from Biol 510, Biol 521, Biol 550, Biol 565, Biol 575, Biol 605, Biol 635, Biol 660, Biol 671, BT 598, BT 599, Chem 512.

Molecular / Microbial

Choose elective courses from Biol 550, Biol 561, Biol 660, Biol 635, Biol 671, BT 598, BT 599, Chem 512, Chem 525, Chem 531, Chem 533.

MS Degree Requirements

30 total credit hours
12 credit hours of biotechnology program core courses
12 credits elective classes in one of the two areas of concentration
6 credit hours of graduate research BT 695 Master's Thesis Research

Research Advisor must be a member of WVSU Biotechnology Graduate Faculty
Thesis Committee is composed of the Research Advisor plus at least two other faculty (one may be an Affiliate Graduate Faculty member)
The Research Adviser and the student's Thesis Committee will assist the student in developing the plan of study for the MS degree and thesis proposal. The student's Thesis Committee must accept both.
a minimum of two sections of graduate teaching experience (even if you're not a GTA)
oral defense of thesis, public presentation of thesis research, hard-copy of thesis accepted by the WVSU Library

MA Degree Requirements

36 total credit hours
12 credit hours of biotechnology program core courses
24 credits elective classes in one of two areas of concentration

No thesis required
A minimum of two sections of graduate teaching experience (even if you're not a GTA)
Written and/or oral comprehensive examination over the course work

Because all Graduate Students are required to teach at least two sections, and because many Graduate Students will be employed as Graduate Teaching Assistants, we strongly encourage all Graduate Students to enroll in the elective **"Seminar for Teaching Assistants"** (BT 501, 1 credit) as early in the Program as possible. One credit of BT 501 counts as a Biotechnology elective.

5. Performance Standards

A normal course load is nine (9) credit hours for full time graduate students. General requirements for graduation vary depending up on the option being sought. All students must complete coursework with a cumulative GPA of 3.0 on a 4-point scale. Students must complete all requirements within a period of five years following the date of admission to the Program. The Dean of the College of Natural Sciences and Mathematics ("the Dean") may extend these limits upon recommendation of appropriate Program faculty member and approval of the Biotechnology Graduate Faculty.

Grading

The following grades are issued for graduate programs with the following GPA value:

A	4.0
B	3.0
C	2.0
F	0.0
I	incomplete

In courses applicable to graduate degrees, only the grades A, B, and S represent satisfactory scholarship.

Grade Point Average and Academic Disqualification

If a student in the Biotechnology Graduate Program receives a final grade of C in two courses in the Program (either Biotechnology courses or other courses required in his/her Plan of Study), that student will receive a Letter of Warning. If a student receives a third C in such courses, he/she will be dismissed from the Program. A final grade of F in a course is grounds for dismissal from the Program.

Academic Warning, Probation, Dismissal

Students may appeal final grades as described (for undergraduate students) in the WVSU Catalog.

The Biotechnology Program will tolerate no academic / professional misconduct. Un-acceptable behavior includes, but is not limited to: plagiarism, cheating, vandalism, fighting. Should anyone be found to have engaged in such behavior, we will immediately remove him / her from the Program, and the infraction will remain on file as part of that student's permanent academic record.

Incomplete Grades

The grade of I (Incomplete) is awarded at the discretion of the instructor upon the request of the student for work not completed because of a serious interruption not caused by the student' s own negligence. Faculty members reserve the right not to award an Incomplete. An incomplete grade is not to be assigned to thesis credits to indicate that the work is in progress. Conditions for completing the course work and having a grade assigned are set by the instructor. The work must be completed by the date decided by the instructor, but no later than the end of two semesters immediately following the semester in which the Incomplete was awarded. A student with two or more grades of I is not permitted to register until the work has been completed and the grade assigned.

Audit Grade

A student wishing an "Audit" grade in a course must officially register for the course. The student must also submit a written request to the instructor by the fourth week of class. The instructor’s decision will be final and will be transmitted to the student in writing. A student may re-register for the course at a later date and receive a grade and academic credit.

Master's Thesis Committee

The Committee consists of the student's Advisor as chair and at least two other members of the Graduate Faculty, one of who may be from outside the department. The Advisor will nominate the members of the Committee after consultation with the student. The Coordinator appoints the Committee members upon the request of the Advisor and sends written notification to the student, Committee members, and Dean. That said, the way it has been done in the Biotechnology Graduate Program is that the student and Advisor choose the Committee, and membership of the Committee is made official by getting signatures on the Graduate Student Checklist.

Thesis Work

"In progress" (IP), "satisfactory" (S) or "unsatisfactory" (U) or letter grades may be assigned each semester for thesis work, since these grades do not imply approval of the thesis itself.

In progress "IP" grades may be assigned to signify adequate progress on theses and projects in which continuous registration is required. All "IP" grades will automatically be changed to "S" grades by the Registrar upon final acceptance of the thesis and completion of all degree requirements.

Only MS candidates are required to write a thesis. The content and format will, for the most part, be determined by your Advisor and Master's Thesis Committee (the "Committee"). Be advised that writing your thesis will be time-consuming and difficult. Understand that your Advisor and Committee will not sign your thesis until they are satisfied with it.

Be aware that WVSU has set standards for theses, and specifies such particulars as the format of the thesis, how copies are to be prepared for binding, and deadlines for submission. If the Library finds that your thesis does not meet editorial guidelines and rejects your thesis, there is nothing we can do about it. Do not wait until the last minute to submit your thesis to the Library. See timelines for graduation, Section 6.

See the **Biotechnology Thesis Handbook** for further information about writing and submitting both the proposal and the thesis.

Repeat Courses

Graduate students may repeat no more than two courses, with no course being repeated more than once. The original grade will remain posted on the student's permanent record and both grades will be used to determine the student's GPA.

Active Status

Active status entitles students to utilize the University resources. Master's programs require a minimum of one credit hour per semester to maintain active status in the program.

Lapses in enrollment for three or more consecutive semesters require that the student apply for readmission subject to the admission procedures, criteria and policies in effect at the time the reapplication is made.

Thesis Enrollment Requirement

Once enrollment in thesis credit is initiated, continuous registration for at least one credit hour each semester (including the summer term) is required until the thesis requirement is fulfilled.

The Program has procedures that ensure that students in the program maintain satisfactory academic progress toward both the required grade point average and completion of degree requirements. Graduate students are herein informed of these procedures at the time they are admitted. The Program Coordinator is responsible for monitoring program compliance with this requirement.

Leave of Absence

A student who finds it necessary to be excused from registration in a graduate degree program for three or more consecutive semesters must formally request a leave of absence from the graduate program. Leave time must be approved by the appropriate academic Dean. Leave will be granted only under exceptional circumstances. Recipients of student loans should note that leave of absence constitutes a break in their program of study, resulting in loss of their loan repayment grace period and/or eligibility for student deferment. International students on F1 and J1 visas normally fall out-of-status during the period of a leave and must return to their home country during the leave.

When a student returns from a leave of absence, decisions concerning previous or current program of studies will be mutually agreed upon by the student's Master's Thesis Committee (for MS students) or the Coordinator (for MA students) and the student.

Readmission

"For the record it will be our practice for any graduate student who does not enroll for a semester or more to obtain approval for re-admission from the Dean of the college which administers his or her graduate program, regardless of the student's academic standing." So Sayeth Dr. Tee.

Comprehensive Examination

Master of Arts (MA) in Biotechnology candidates are required to take and pass a comprehensive examination. This must be completed no later than Week 9 of the final semester. Comprehensive exams will include all graduate coursework taken by the student while in the Program. The Faculty member who taught each course (or if he/she is not available, faculty members possessing expertise in that area) will write and grade questions for that topic.

Graduation

The student is responsible for making certain that all requirements have been met and that every deadline is observed.

Each student who plans to graduate is required to submit to the Registrar's Office an Application for Graduation form. This form, supplied by the Registrar's Office, must be submitted before the end of the third week of classes of the academic semester in which graduation is expected (see Section 6 of this Manual). A student turning in the Application for Graduation after the deadline will graduate the following semester. A graduation fee ($130 in AY 2013-2014) must be paid at the time of application. The Application for Graduation must be signed by the academic advisor prior to being submitted to the Registrar's office.

A student denied graduation must complete the requirements for graduation and reapply for graduation. A student must be registered for the semester in which the degree is received.

The University will confer the Master's degree when the following minimum conditions have been met:

Submission of the required application for graduation form

Certification by the Dean that all requirements of the degree being sought have been completed

Achievement of the grade requirements as defined in the University Catalog and by the Program

Satisfactory completion of a thesis, including its acceptance by the WVSU Library (MS degree only)

Successful completion of the comprehensive exam (MA degree only)

No student shall be approved for graduation before the Dean has certified to the Registrar that all academic requirements have been met. The Registrar must promptly notify the candidate and the Dean (or Coordinator) if graduation is not approved for any reason.

Time Limitations

Biotechnology students must complete their degrees within five years from the date of matriculation. Transfer credit must be based on graduate work completed within the five-year period immediately preceding matriculation. Students may apply to revalidate credit taken more than five years prior to matriculation, if course work is relevant to the degree and if approved by the Coordinator and Dean.

Applicants for readmission whose last enrollment in the Program was five or more years prior must have their transcripts re-evaluated by the Coordinator and the Advisor (MS degree). Some courses may need to be repeated or some additional course work required.

Transfer Credit

Students may apply for transfer of a maximum of six (6) graduate credits to be used toward the requirements of the degree. Ordinarily, these transfer credits will satisfy elective requirements only. Transfer credit must be based on graduate work completed within the five-year period immediately preceding matriculation. A petition for Transfer Credit Form (Appendix F) should be filled out by the student and, with an official transcript attached, should be submitted to the Coordinator. Be sure to meet with your advisor to discuss transfer credits and assure that the required courses fit your program of study.

Students requesting a transfer of credit are obligated to make the case for the courses in question. If the requested transfer is for a graduate level course equivalent to one of our own courses, this is usually not an issue and the transfer petition can be handled routinely. If the requested transfer is for a graduate level course not equivalent to one of our own or from a field other than Biotechnology, the student should provide the Coordinator with two things. First is a written rationale for how the course makes an essential contribution to their program of study. Second is a copy of the syllabus of the course in question. Other information may be requested as needed.

6. Timeline and Deadlines for Progress in the Program

Note that summer(s) counts as a semester, whether you take classes in the summer or not.

MS Degree:

In your first semester in the program:

With the help of Ms. Audrana Austin and the Program Coordinator, make sure that all items on the Biotechnology Graduate Program Student Requirement Checklist (Grad Checklist) are completed. This is located in Hamblin 103. Note that each step of your journey through the program requires signatures on the checklist. This form is shown Appendix G.

Get to know the faculty members with whom you might do research for your MS. Ask questions, discuss, and negotiate.

With the consent of the faculty member, commit to a lab in which to do your MS research (i.e., choose a Master's Thesis Advisor) and get the Advisor's signature on your Graduate Student Checklist. Your Checklist is kept in your file in H103.

Take the course "Seminar for Teaching Assistants" (BT 501).

In your second semester:

With the help and approval of your advisor, form a Master's Thesis Committee and get their signatures on your Checklist.

With the help and approval of your Advisor and Committee, establish a Plan of Study and get signatures.

In your third semester:

With the help of your Advisor, write your Master's Thesis Proposal. Submit your completed Proposal to your Committee two weeks prior to meeting with them.

Meet with your Committee, secure their approval of your Proposal, and get signatures.

In the semester before you intend to graduate:

With your advisor, determine when you will graduate. Make sure that you have:

Completed all required coursework (with appropriate GPA), or are currently enrolled (This includes core Biotechnology courses, research credits, and electives.

Gotten all transfer credits and other anomalies on-record with WVSU. Remember, if it's not on your WVSU transcripts, it doesn't exist.

Completed all course deficiencies or other un-fulfilled requirements (You must be un-conditionally enrolled in the program.)

Completed (or are currently competing) two sections of teaching.

In the semester in which you intend to graduate:

You must be an active student (i.e., enrolled for at least 1 credit) in the semester that you graduate.
You must apply for graduation by the date announced in the WVSU Academic Calendar for that year.
You must finish your research.
If your advisor and/or committee so chooses, establish a "**Thesis Writing Plan**" by the **Friday of Week 3**. This is a written agreement between you, your Advisor and your Committee that sets deadlines for writing and completing the thesis.

Write your thesis. Allow plenty of time.
Get approval from your Advisor that the thesis is complete and ready to defend.
Announce / advertise the **public presentation** of your thesis no later than two weeks prior to presentation (by **Friday of Week 12**).
Give completed, ready-to-sign copies of the thesis to your Advisor and Committee. **Schedule your thesis** defense at least one week prior to the defense (by **Monday of Week 13**).
Defend your thesis no later than **Monday of Week 14**.
Make corrections to your thesis to the satisfaction of your Advisor and Committee
Get final approval of your thesis. Have your Advisor and Committee sign (the signature page of) the completed copies of your thesis.
Do a **public presentation** no later than the **Friday of Week 14**.
Give a minimum of three **final copies** of your thesis, ready for binding, to the library no later than **4:00 pm, the Thursday of Week 16** (i.e., three days before commencement).
Upon receipt of three ready-to-bind theses, the library will give you a written Master's Thesis Deposit Receipt. Return it to your Advisor.
The library will return one bound copy to the Biology Department for the Department files.
The Department will pay you for this copy.
Your advisor will officially notify the Coordinator that you have completed all requirements for the MS degree. The advisor forwards a copy of the Master's Thesis Deposit Receipt to the Coordinator.
The Coordinator and Dean will notify the Registrar that all requirements for your graduation are completed. Deadline for the Registrar to receive the letter is **12:00 noon, the Friday of Week 16** (i.e., two days before commencement).
If notified of a problem with your graduation, the Coordinator will notify you immediately.

MA Degree:

In your first semester in the program:

With the help of Ms. Audrana Austin and the Program Coordinator, make sure that all items on the Biotechnology Graduate Program Student Requirement Checklist (Grad Checklist) are completed. This is located in Hamblin 101D. A copy of this form is shown in Appendix G.

As an MA student, your advisor is the Coordinator of the Biotechnology Graduate Program

In the semester before you intend to graduate:

Meet with the Coordinator to verify that you are ready to graduate. Be sure that
- You have completed all required coursework (with appropriate GPA), or are currently enrolled. This includes core Biotechnology courses and electives.
- You have gotten all transfer credits and other anomalies on-record with WVSU. Remember, if it's not on your WVSU transcripts, it doesn't exist.
- You have completed all course deficiencies or other un-fulfilled requirements (you must be un-conditionally enrolled in the program)
- You have completed (or are currently competing) two sections of teaching.

During the semester in which you intend to graduate:

You must be an active student (i.e. enrolled for at least 1 credit) in the semester in which you graduate.
You must apply for graduation as announced in the WVSU Academic Calendar.
You must pass a **Comprehensive Exam**, based on information from, and administered by faculty who teach Biotechnology Core courses. Deadline is by the **end of Week 9**.
The Coordinator and Dean will notify the Registrar that all requirements for your graduation are completed. Deadline is the 5:00 pm, the Wednesday of Week 16.
If notified of a problem with your graduation, the Coordinator will notify you immediately.

7. Safety

At the start of each academic semester, the Biotechnology Graduate Faculty hold an Orientation and Safety Meeting for all Biotechnology Faculty and Graduate Students (old and new). Purposes of the meeting include introduction of Program personnel, orientation as to matters of registration and scheduling, and other administrative topics. However, an important topic covered in these meetings is safety, especially in the laboratories. Attendance is mandatory, and roll is taken. Please understand that safety is paramount in the WVSU Biotechnology Graduate Program.

The College of Natural Sciences and Mathematics has a Safety Committee which coordinates with the campus-wide Safety and Parking Committee. An NSM Safety Manual is currently being prepared. Many safety and emergency protocols are already in place, and will be explained during the Orientation and Safety meeting.

Also refer to safety information linked to the WVSU web page. We encourage all students to enroll in the WARN (Wide Area Rapid Notification) system. This is done through the WVSU web page. The following documents are also linked to the WVSU web page under "Campus Safety":

Emergency Response Guide
Campus Crime
Emergency Response Memo - February, 2010
Emergency Response Guide - Shelter-In-Place Procedures

8. Graduate Student Association

In AY 2007 - 2008, the students of the Biotechnology Graduate Program formed the Graduate Student Association. Through this fully-recognized academic organization, Graduate Students can speak with a stronger voice to address the entire range of issues that affect them. A representative of GSA participates at faculty meetings of the Program. The GSA actively participates in recruitment, informational and public relations activities. An GSA web site is in the offing.

9. Frequently Asked Questions and Updates to the Manual

Students, Faculty and Staff are encouraged to continually update the Graduate Student Manual, root out errors, add new and relevant info, etc.

Must graduate students be full-time to get a GTA or GRA?

Yes

May a grad be full-time with a combination of grad and undergrad courses?

Yes. Any course will count if it is part of the student's approved Plan of Study.

May MCATs substitute for GREs ?

No

May research credits count as MA electives?

A maximum of four (4) credits of Master's Thesis Research (BT 695) may be credited toward the MA degree. The decision to permit this is given by the student's advisor.

For MS students, may Master's Thesis Research credits may be counted as electives?

No

May BT 511 credits count as electives?

Up to two BT 511 courses may count toward graduation, but you may take more BT 511s as free electives.

In order to be eligible for an Evans-Allen Graduate Research Assistantship during the summer, must a student be enrolled in the summer 3 or 6-week session? Must he/she be full-time?

Answer is pending

Are summer Evans-Allen RAs full or part-time?

Part-time if they're also taking classes, full-time if they're not

Do grads get a tuition waiver for summer classes?

Mr. Casto (*circa* 2009) says no summer tuition waivers, period. Something about the angle of the sun.

Will the Program have mandatory lab rotations for new students?

There will be no formal lab rotations. Students in their first semester will be strongly encouraged to shop around for labs, such that they can make a decision (in writing, signed on the Graduate Student Checklist) by the end of the first semester.

What if an MS student wants to change labs?

An MS student may leave his/her lab (i.e., discontinue his/her association with the Master's Thesis Research Advisor). However, if a student leaves his/her Master's Thesis lab, his/her continued support is his/her own concern; the Program is under no obligation to find alternative support. Although the Biotechnology Faculty "make every effort to continue supporting the student for four (4) contiguous semesters", the clock does not start again when a student enters a new lab.

Must students take BT 501?

At the faculty meeting of August 15, 2012, it was agreed by consensus that, although BT 501 will not be officially required, all new students will be strongly prevailed upon to take the course in their first semester, and thereafter as deemed necessary by their teaching performance.

Can grad students who don't get a degree get a Certificate in Biotechnology?

At meeting of April 5, 2013, faculty say "yes", assuming that all requirements of the certificate are met. Students may not receive both a Certificate and a degree.

Do grads get their lab fees covered by their tuition support?

On September 23, 2013, the cashier says "no", they have to pay their own lab fees.

Must GTAs hold office hours?

GTAs must hold one office hour per class they teach. minutes of Aug 17, 2011

Apart from assistantships, are there other grants or scholarships available to Biotech Grad Students?

Yes. For example, the Dr. Ida F. Kramer Endowed Scholarship is often awarded to Biotech Grad Students who are preparing to teach in higher education. Your advisor will be glad to help you find and apply for a host of grants, which will both support your work and theirs. Looks great on your *CV*, too. Watch Hamblin Hall bulletin boards for opportunities.

Is tuition waived / covered for undergraduate courses?

In Spring 2010, Bryce Casto ruled that graduate students may not get tuition waived for undergraduate courses.

May a student who has already taken (for credit) a 3XX course later take the same course at the 500 level (5XX) for credit?

At the March 21, 2014 Biotech Faculty meeting, the answer was "no".

Must an MS student write and follow a "Thesis Writing Plan"?

Before March 21, 2014, the answer was "yes". But at that meeting, this requirement was changed to one that the student's advisor and/or committee may require, if they so choose.

Are Skype interviews required only for international applicants?

No. At the meeting of April 4, Biotech Faculty agreed that all applicants who are unknown to us should do a Skype (or in-person) interview.

Is Advanced Organic Chemistry (Chem 525) an approved graduate elective?

Yes

10. Appendices

Appendix A ..... Application Checklist

_____ Sealed, official transcripts from all post-secondary institutions. We require a minimum GPA of 3.0 on a 4-point scale (both in the natural sciences and over-all GPA). Send this to WVSU Admissions Office, 124 Ferrell Hall. University address: **Box 1000, Institute WV 25112-1000**.

_____ cumulative GPA Also give a GPA in natural sciences, if known: _____

_____ application form (Appendix B) Send to Biology Dep't., 101 Hamblin Hall, WVSU

_____ statement of purpose (Appendix C) Send to Biology Department, 101 Hamblin Hall, WVSU

_____ 1 three letters of professional recommendation (Appendix D) Send to Biology Department, 101 Hamblin Hall, WVSU

_____ 2

_____ 3

_____ GRE score: verbal at least 140, quantitative at least 150 (old system: 950 combined)
University code for WVSU is 5903. Send to Admission Office, 124 Ferrell Hall, WVSU

_____ application fee: $24 for in-state applicants, $34 for out-of-state applicants
checks payable to West Virginia State University (non-refundable)
Send to Biology Department, 101 Hamblin Hall, WVSU

_____ If you are receiving an assistantship, we require a letter of intent. (Appendix E)
Send to Biology Department, 101 Hamblin Hall, WVSU

additional admission requirements for international applicants

_____ evaluation of transcripts by an evaluator such as **www.wes.org** or **www.ece.org**
Send to Admissions Office, 124 Ferrell Hall, WVSU

_____ TOEFL score of at least 80 (old system 550) university code for WVSU is 5903
or Send to Registration + Records, 128 Ferrell Hall
_____ IELTS score of at least 7

_____ We require an affidavit of financial support for at least $10,000. There is no form.
Send to Biology Department, 101 Hamblin Hall, WVSU

_____ proof of immunization in an official document from a physician indicating dates of immunizations for the following (no form). Send to Biology Dep't., 101 Hamblin Hall, WVSU

mumps / measles / rubella (MMR) hepatitis B meningococcal meningitis

_____ We reserve the right to ask for a Skype interview with accompanying authentication of identity.

Appendix B..... Application for Admission

WEST VIRGINIA STATE UNIVERSITY

Return to: Biology Department, BT Grad Program, West Virginia State University
101 Hamblin Hall, P. O. Box 1000, Institute, WV 25112-1000
Phone: (304) 766-3102

Personal Data:

Date of Application		Social Security Number					
Last Name		First Name		MI:			
Preferred First Name		Date of Birth					
Current Address: Street or P. O. Box:							
City:		State:		Zip:		County:	
Home Phone Number:		Business/Other Phone Number:					
Email:		Pager:					
Permanent Address (if different):							
Have you ever been enrolled in school under any other name(s)?	Yes		No				
If so, please provide full name(s):							
Are You a U.S. Citizen?	Yes		No		If not, please indicate immigration status:		
		VISA:					
(Include a copy of both sides of your I-551 Card)							

Name of Parent, Guardian or Spouse: (May be used in case of emergency—optional):

(Last, First, Middle):		Relationship:					
Street or P. O. Box:							
City		State		Zip		County		Country	
Home Phone:		Business/Other Phone:					
Email:		Pager:					

Additional Personal Data: (Disclosure of additional personal data is optional and will in no way affect a decision concerning your application.)

Date of Birth:		Birthplace (State):		Male:		Female:	
Ethnic Status:		Have you ever served in the US Armed Forces?		Yes		No	
Will you be applying for veteran's benefits?		Yes		No			

Enrollment Data:

Degree in which you plan to enroll:	MA		MS	
Year you plan to enroll:		Term/Semester you plan to enroll:		
State of Residency:		If resident of WV, how long have you (and /or your parent		
or guardian) lived in WV?	Years		Months	

Student Category:

1.		Post-Baccalaureate Graduate	2.		Transient Graduate

Academic History:
College(s) Attended (Undergraduate):

Name of College/University	City	State	Date of Graduation	Degree	Major

	I plan to take		Took the GRE in	Mo.		Year	
My GRE scores are:	V		Q		Written Assessment:		

Have you been suspended or expelled for academic or disciplinary reasons? Yes ☐ No ☐.
If you have, are you currently eligible to return to that institution? Yes ☐ No ☐.

List the three (3) people you are asking to write letters of recommendation. They should be familiar with your educational and/or professional work and be able to evaluate your potential success as a graduate student.

name position address email

1.

2.

3.

//

I certify that all statements in this application are complete and true and I give the aforementioned Institutions permission to use this information for statistical and reporting purposes. I further understand that any willful misrepresentation of information given in this application may be grounds for denial of my admission or dismissal.

signature:_____date:_____

Note: West Virginia State University adheres to the principles of equal opportunity without regard to race, color, gender, age, creed, national origin or disability. This policy extends to all programs and activities supported by the college.

Appendix C..... Statement of Purpose

Your statement should include your purpose in pursuing graduate study, any research you wish to pursue, and your future career goals.

Appendix D..... Letter of Recommendation

February 10, 2014

West Virginia State University
Biotechnology Graduate Program

name of applicant _____

---

to the student applicant:

The Family Privacy Act allows applicants to inspect and review all materials in their files, except for letters of recommendation written prior to January 1, 1975.

Upon its completion and submission, college faculty will utilize this document to evaluate your qualifications to be admitted into the Biotechnology Graduate Program. It may also be used to assist in the selection of Graduate Assistants. Before submitting this form to the person who will be writing your recommendation, be sure to check one of the following statements relative to the confidentiality of your files.

_____ I **DO** wish to waive my right to see this document

_____ I **DO NOT** wish to waive my right to see this document

Signature of applicant, date _____

To the person making this recommendation

The above-named applicant for admission to the Biotechnology Graduate Program has given your name as a reference. The Program would appreciate your cooperation in providing the following information regarding the applicant's qualifications. References should be acquainted with the applicant's academic ability. Please print or type.

What is your name and title/position? _____

What is your institution (name and address) ? _____

_____

How long have you known this applicant, and in what capacity? _____

_____

_____

Using the scale **high, average, low,** or **cannot judge**, rate the applicant's characteristics with respect to the following criteria. Use your own student body and recent graduates as a reference group. If the applicant is an employee, use other employees with similar backgrounds as a reference group.

characteristic	high	average	low	cannot judge
General intelligence	_____	_____	_____	_____
Knowledge of the field	_____	_____	_____	_____
Maturity	_____	_____	_____	_____
Dependability	_____	_____	_____	_____
Work ethic	_____	_____	_____	_____
Research potential	_____	_____	_____	_____
Teaching potential	_____	_____	_____	_____

What is your over-all recommendation for this applicant?

_____ very strong _____ strong _____ average _____ below average

_____ recommend with reservations (please explain below)

On letterhead, please provide additional comments concerning this applicant's strengths and weaknesses. Comments should pertain to the applicant's ability to undertake graduate studies. Be as specific as possible.

When you have completed this form, **either** enclose it in a sealed envelope with your signature across the seal, then give it to the student. The student will then include your recommendation with the completed application portfolio **or** send this recommendation directly to

Biotechnology Graduate Program, Biology Department
101 Hamblin Hall
West Virginia State University
P.O. Box 1000
Institute WV 25112-1000

If you have any questions or comments, please feel free to contact Dr. Richard Ford, Coordinator of the Biotechnology Graduate Program, West Virginia State University, 101D Hamblin Hall, Box 1000, Institute WV 25112-1000 fordri@wvstateu.edu 304-766-5742

We appreciate your time and effort.

Appendix E..... Letter of Intent

We want to know if you agree to accept the assistantship.

The following information constitutes conditions and terms of an offer made to you for the position described below. West Virginia State University uses this information for the purpose of maintaining personnel files. No persons outside the university are routinely provided this information. If you accept this position, your signature is required.

Name:			
(*Last Name*)		*(First Name)*	*(Middle)*
Address:			
Program:	Academic Affairs / Title III	Student SS#	
Responsibilities:	Teaching Laboratory Component of Biology Courses		

(Note: Financial restraints and program changes may result in adjustment in specific responsibilities and/or sources of funds during the period of appointment.)

Length/Date of appointment:		To:	
Fractional time appointment:	.50	Hours per week service:	20
Annual Stipend:	$12,000.00 **per academic year *(not including summer)***		
Position Offered by:	Biotechnology Graduate Program		
(Program)			
		Date:	
(Department Chair/Program Coordinator)			
(Dean of Natural Sciences and Mathematics)		Date:	

Approved by:	Date:	

(Vice President for Academic Affairs/Dean of Land-Grant Programs)

Approved by:	Date:	

(Executive Coordinator)

Note: WVSU required graduate assistants to be enrolled as students.

Are you a citizen or permanent resident of the United States?

	Yes		No	*(If No is checked, you must attach a signed Nonimmigrant Work Understanding.)*

I accept the position described above (Please sign on the line below.)

Signed:						Date:		
After signing, please return this form by:								
To:			Address:					
Copies to:	☐	Student	☐	Department	☐	Academic Dean	☐	Vice President for Academic Affairs

Appendix F.....**Petition for Transfer of Graduate Credits**

West Virginia State University Biotechnology Graduate Program

name: _____ WVSU ID: _____
last first maiden or middle

home address: _____ city: _____

state: _____ zip: _____ country (if not U.S.): _____

e-mail: _____ telephone: _____

concentration: _____ Organismal / Environmental _____ Molecular / Microbial

COURSES REQUESTED TO BE TRANSFERRED TO WVSU:

(1) institution name and location: _____

sem / yr	dept. and number	course title	credits	grade	transfer as: core / elective

remarks:_____

(2) institution name and location: _____

sem / yr	dept. and number	course title	credits	grade	transfer as: core / elective

remarks:_____

petition for transfer: _____
Student's signature date

petition approved and transfer credits recommended by: _____
Advisor's signature date

approved by Coordinator _____
Coordinator's signature date

approved by Graduate Coordinator _____
Graduate Coordinator signature date

Note: Transfer Policy Graduate credit may be transferred from other institutions provided that:
The credit is certified as being graduate-level and is from an accredited graduate institution;
The grade is a B or higher;
The course did not provide credit towards a previous degree already received;
The credit is approved as appropriate to the student's degree program by his/her advisor;
Credit earned in quarter hours should be converted to its semester hour equivalents

6. You provide your Advisor with an official transcript(s) from the institution from which you wish to transfer credits.

Appendix G..... Graduate Student Checklist *form Spring 2014*

---

name _____ MS or MA track _____

application materials

_____ Application for Admission
_____ Statement of Purpose
_____ Letter of Reference 1
_____ Letter of Reference 2
_____ Letter of Reference 3
_____ GRE: verbal 140, quant 150 ..... goes to admissions or Mary Wickiser
_____ application fee: $34 (AY 2013 - 2014)
_____ Letter of Intent

international applicants:

_____ *transcript evaluation ..... goes to admissions?*
_____ *TOEFL or IELTS ..... goes to registrar*
_____ *affidavit of support*
_____ *proof of immunization: MMR, Hep B, meningococcal meningitis*
_____ *Skype interview*

---

semester started in the Program _____

Orientation and Safety Seminar (date) _____

What deficiencies / remediation must the student do, in addition to normal Biotech coursework?

_____

signature of **Faculty Advisor** and date (MS only) _____

signatures of **Thesis Committee (MS)**

_____ _____

_____ _____

graduate coursework MS needs 30 credits, MA needs 36 credits

core courses MS and MA need 12 credits

BT 511	Seminar	1 credit	_____
BT 511	Seminar	1 credit	_____
BT 555	Statistics	3 credits	_____
BT 567	Current Concepts	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____

teaching (MS and MA) All students must have taught at least two sections.

_____ _____

signatures of **Committee approval of Plan of Study** (MS and MA)

_____ _____

_____ _____

Committee signatures of **approval of thesis proposal** (MS)

_____ _____

_____ _____

Committee signatures of **approval of Thesis Writing Plan** (MS)

_____ _____

_____ _____

Committee signatures on **public presentation of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Committee signatures on **oral defense of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Coordinator's signature on **comprehensive examination** (MA) indicate pass or fail

_____

signatures of Advisor, Committee, Coordinator and Dean signature page on **completed thesis** (MS)

thesis delivered to Library (MS) Library issues a Master's Thesis Deposit Receipt. Keep a copy in the file.

Advisor's **letter recommending student for graduation** (MS) Keep a copy in the file.

Coordinator and Dean **letter recommending student for graduation** (MS and MA) Keep a copy in the file.

Biology Lab Manager signature says all **Biology Department keys have been returned**. (MS and MA)

_____

Please leave **contact info** with Ms. Glenna Curry so we can keep in touch after you leave WVSU.

Appendix H..... Evaluation of Graduate Teaching Assistant

The faculty member in charge of the course should, throughout the semester, observe the Graduate Teaching Assistant's work in both the classroom as well as in preparation for their teaching. The faculty member should provide guidance to the GTA as needed during the semester. The faculty member should complete and sign this form during the final two weeks of the semester. The GTA should sign to acknowledge his/her receipt of the form, and may attach a written response to the evaluation. Signed copies will be given to the GTA and the faculty member, and the original will be kept in the GTA's file.

GTA being evaluated _____ faculty member doing the evaluation _____

course, section(s), semester, year _____

date(s) of classroom observation(s) _____

How often did the GTA teach the lab?

____ always ____ usually ____ some ____ rarely ____ never ____ NA / ?

.....

On a scale of 1 (worst) to 5 (best), or ? if unknown, how would you rate the GTA in:

_____ punctuality in starting and ending labs

_____ knowledge of the theory underlying the labs

_____ knowledge of the lab activities

_____ conveying to students the purpose of the lab vis-à-vis the theory

_____ teaching effectiveness

_____ interactions with the students in class

_____ interactions with students outside of class

_____ effectiveness in testing

_____ test preparation (appropriate, fair)

_____ grading (appropriate, fair)

_____ promptness in returning materials to students

_____ keeping appointments made with the students and faculty

_____ maintaining a professional demeanor and attitude

_____ growth / development during the semester

_____ **average score** (excluding NA / ?)

.....

Specifically or generally, what are the GTA's best qualities with respect to his/her job?

Specifically or generally, in what areas should the GTA work to improve?

other remarks, observations, suggestions:

In sum, was the GTA's performance unsatisfactory, satisfactory, or superior?

signature of faculty member in charge of course _____ date _____

signature of GTA _____ date _____

Signature of the GTA does not denote agreement with the comments, only that the GTA has had the opportunity to review this evaluation. The GTA may, if desired, attach a written response to the evaluation which will accompany this evaluation in the GTA's permanent file.

Appendix I..... Renewal / Continuation of Graduate Teaching Assistantship

from the Graduate Student Manual:

"Recipients of Graduate Teaching Assistantships (GTA) are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters. ...

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught. ...

At its meeting of August 19, 2009, the Biotechnology Graduate Faculty decided that Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). .... Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen."

Using appropriate criteria, the Biotechnology Graduate Faculty decide to whom to award GTAs. Normally, GTAs extend for two semesters, and are normally renewed for a total of four consecutive semesters. However, it is the responsibility and prerogative of the Faculty to monitor GTAs in all aspects of their academic performance, and with due process, to terminate any GTA who fails to fulfill the requirements of the GTA.

---

1. student name and A number _____

2. year and semester for which the student seeks renewal of his / her GTA _____

3. In the semester for which the student seeks renewal of his / her GTA, will he / she be a full-time student?

4. Has the student met all requirements and deadlines, this semester and for previous semesters, for progression through the Biotechnology Graduate Program?

5. How well is the GTA performing, so far? Is there any reason why the assistantship should not be renewed? If there is a problem, has the GTA been duly advised of the problem (in writing), and given assistance in correcting the problem? If there's anything negative to report, please attach a detailed written statement.

    A. **reports from the GTA's supervising Faculty in the current semester** Include a formal Evaluation of GTA form (Appendix H) or a WVSU Classroom Observation Report.

    B. **report from the Thesis Advisor (MS students) or Program Coordinator (MA students)**

    C. **report from the Biology General Education Coordinator** (where appropriate)

    D. **report from Biotechnology Graduate Program Coordinator**

    E. **other reports** (ex. Dean of the College of NSM, other Graduate Faculty, Laboratory Manager)

Appendix J..... Graduation Checklist

March 4, 2014

Graduate Coursework MS needs 30 credits, MA needs 36 credits **3.0 GPA**

core courses MS and MA need 12 credits

BT 511	Biotechnology Seminar	1 credit	_____
BT 511	Biotechnology Seminar	1 credit	_____
BT 555	Biostatistics	3 credits	_____
BT 567	Current Concepts in Biotech	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

Electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

Research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____	
BT 695	Master's Thesis Res.	_____	_____	
BT 695	Master's Thesis Res.	_____	_____	**GPA** _____

Teaching (MS and MA) at least two sections _____ _____

Comprehensive Exam (MA only) _____

Deficiencies Rectified _____

Thesis (MS only)

thesis committee formed	_____	thesis presentation passed	_____
proposal approved	_____	thesis defense passed	_____
thesis writing plan approved	_____	thesis accepted by Library	_____

Appendix K..... Graduate Certificate in Biotechnology

Graduate Certificate in Biotechnology
West Virginia State University
Biology Department / Biotechnology Graduate Program *March 18, 2011*

A "Graduate Certificate in Biotechnology" from the West Virginia State University Biotechnology Graduate Program is earned by completing and passing the following courses:

1. Biotechnology Seminar (BT 511) ... taken twice	1 credit each	
2. Biostatistics (BT 555)	3 credits	
3. Current Concepts in Biotechnology (BT 567)	3 credits	
4. Techniques in Biotechnology I (BT 571)	2 credits	
5. Techniques in Biotechnology II (BT 572)	2 credits	12 credits total

A student may count no more than two (2) final grades of "C" toward the certificate, and must have a GPA of 2.5 or better in these 12 credits.

Entrance requirements are: an undergraduate degree in a related field, an undergraduate GPA of at least 3.0 (on a four-point scale), TOEFL scores where appropriate of at least 550 (or at least 79 on the computer test), and approval of the Biotechnology Graduate Faculty. The Biotechnology Graduate Faculty may, under special circumstances, waive any of the other entrance requirements, including course prerequisites.. It is understood that students entering the Graduate Certificate in Biotechnology program have a current knowledge of the fields of Cell Biology / Physiology, Genetics (Classical and Molecular), and Chemistry (at least three semesters of college-level Chemistry).

Course transfers and course substitutions are to be decided by the Biotechnology Graduate Faculty, with the certificate candidate being responsible for providing any supporting documentation. No more than four (4) credits may be transferred from another institution.

This Certificate program will take effect in the Fall 2011 semester. However, students may apply these courses (with acceptable final grades) taken in previous semesters to certificates to be awarded in Fall 2011 or later semesters. All courses to be applied to the Graduate Certificate in Biotechnology must be completed within five (5) years of the semester in which a the student starts the program.

The University will charge no fee for awarding a Graduate Certificate in Biotechnology.

For more information, contact the Coordinator of the Biotechnology Graduate Program

Dr. Richard Ford
101D Hamblin Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-5742 fordri@wvstateu.edu

To apply, contact the Director of Registration and Admissions

Ms. Donna Hunter
127 Ferrell Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-4146 hunterdl@wvstateu.edu

Exhibit H: Evaluation of Graduate Teaching Assistant by Instructor of Record (Form)

The faculty member in charge of the course should, throughout the semester, observe the Graduate Teaching Assistant's work in both the classroom as well as in preparation for their teaching. The faculty member should provide guidance to the GTA as needed during the semester. The faculty member should complete and sign this form during the final two weeks of the semester. The GTA should sign to acknowledge his/her receipt of the form, and may attach a written response to the evaluation. Signed copies will be given to the GTA and the faculty member, and the original will be kept in the GTA's file.

GTA being evaluated _____ faculty member doing the evaluation _____

course, section(s), semester, year _____

date(s) of classroom observation(s) _____

How often did the GTA teach the lab?

____ always ____ usually ____ some ____ rarely ____ never ____ NA / ?

.....

On a scale of 1 (worst) to 5 (best), or ? if unknown, how would you rate the GTA in:

_____ punctuality in starting and ending labs

_____ knowledge of the theory underlying the labs

_____ knowledge of the lab activities

_____ conveying to students the purpose of the lab vis-à-vis the theory

_____ teaching effectiveness

_____ interactions with the students in class

_____ interactions with students outside of class

_____ effectiveness in testing

_____ test preparation (appropriate, fair)

_____ grading (appropriate, fair)

_____ promptness in returning materials to students

_____ keeping appointments made with the students and faculty

_____ maintaining a professional demeanor and attitude

_____ growth / development during the semester

_____ **average score** (excluding NA / ?)

.....

Specifically or generally, what are the GTA's best qualities with respect to his/her job?

Specifically or generally, in what areas should the GTA work to improve?

other remarks, observations, suggestions:

In sum, was the GTA's performance unsatisfactory, satisfactory, or superior?

signature of faculty member in charge of course _____ date _____

signature of GTA _____ date _____

Signature of the GTA does not denote agreement with the comments, only that the GTA has had the opportunity to review this evaluation. The GTA may, if desired, attach a written response to the evaluation which will accompany this evaluation in the GTA's permanent file.

Exhibit I: Evaluation of Graduate Teaching Assistant by Program Coordinator (Example)

Name withheld, Graduate Teaching Assistant

Dr. Richard Ford	Observer
Dr. Jonathan Eya	Lead Instructor of the course
Name withheld	TA team-teaching with Mr. X

Principles of Biology (Biol 101 section 02), lab
February 13, 2013, 2:00 pm, Hamblin Hall room 205
17 students present, 20 students enrolled

The objective of the day's laboratory exercise was to do the Macromolecules Lab from the "Principles of Biology Lab Manual".

Mr. X's methods were to do a traditional pre-lab lecture, supported by a PowerPoint presentation that I think he put together himself. The PowerPoint included both the outline of his talk and simple illustrations. He also referred students to the lab manual.

Mr. X's methods were effective, in that the PowerPoint helped organize the four-part exercise in visual form, and allowed students to see in written form the terms being presented. It probably also helped keep Mr. X organized and on-track.

Mr. X was well-prepared. This was evidenced by his PowerPoint presentation, by the lab materials having been neatly set up around the room, by the absence of confusion in his lecture, and by the fact that he started class exactly on time. I also note that he presented background information of sufficient detail to support the underlying theory and illustrate its relevance, without being so detailed as to confuse or bore the students.

Mr. X did a reasonable job in making the lab experience interesting, understandable, coherent and relevant. I think he did this by understanding the material himself, and then by presenting it to the students in an organized, clear, comfortable manner. He pointed out several examples of where students would experience the differences among macromolecules in their daily lives (ex. the grease on the bottom of a bag of fast food).

There was a notable dearth of questions during the pre-lab lecture. In the first 30 minutes, Mr. X twice asked "Are there any questions?", which is a good start. I recommend that he do that much more often, especially at transitions between topics. I also recommend that he ask probing questions to individual students, by name, as in "So Bobby, what if you dunked a powdered doughnut into Benedicts' Reagent?". Mr. X got no questions from students during his lecture. He did, however, start getting questions from students one-on-one as the lab activity got underway.

Mr. X's communication skills were fine; no problem here. But this does lead me to report that the class seemed strangely subdued. There was no student chatter, which is good, but almost no student-student interaction, which is odd. I saw no smiles the entire time. Of course, different classes have different group personalities. And the "observer effect" may be at work! But I would encourage Mr. X to foster a comfortable learning environment in which to engage students in learning, one in which questions can be asked without hesitation, etc. Another suggestion is that, in order to keep multi-part lab exercises from blurring in students' minds, to make breaks between topics more distinct.

All-in-all, I observed Mr. X doing a fine job in his first semester as a teacher. I encourage him to continue coming to class well-prepared and on top of his game. I believe he'll continue to improve, as do all good teachers throughout their careers.

_____ _____

Observer's signature and date Instructor's signature and date

** Note that the signature merely means that the Instructor has received and reviewed the report. It does not indicate agreement with the report.

Exhibit J: Evaluation of Graduate Teaching Assistant by Program (Form)

from the Graduate Student Manual:

"Recipients of Graduate Teaching Assistantships (GTA) are chosen by the Biotechnology Graduate Faculty, based on such factors as the number of assistantships available and the academic preparedness of the candidates. Once a graduate student has been awarded a GTA, the Faculty make every effort to continue supporting the student for four (4) contiguous semesters. ...

The teaching performance of GTAs is to be evaluated each semester by the faculty member with whom the GTA has taught.

At its meeting of August 19, 2009, the Biotechnology Graduate Faculty decided that Graduate Teaching Assistantships will not be awarded to students who are delinquent in meeting their deadlines toward graduation (ex. in the second semester in the program, MS students must form a Thesis Committee, complete with committee members' signatures). .... Graduate Students who are not up-to-date with Program deadlines jeopardize their eligibility for renewal of their Graduate Assistantships. Although it is the responsibility of the student to know and meet all deadlines, the Thesis Advisor and Coordinator will help this happen."

Using appropriate criteria, the Biotechnology Graduate Faculty decide to whom to award GTAs. Normally, GTAs extend for two semesters, and are normally renewed for a total of four consecutive semesters. However, it is the responsibility and prerogative of the Faculty to monitor GTAs in all aspects of their academic performance, and with due process, to terminate any GTA who fails to fulfill the requirements of the GTA.

---

1. student name and A number _____

2. year and semester for which the student seeks renewal of his / her GTA _____

3. In the semester for which the student seeks renewal of his / her GTA, will he / she be a full-time student?

4. Has the student met all requirements and deadlines, this semester and for previous semesters, for progression through the Biotechnology Graduate Program?

5. How well is the GTA performing, so far? Is there any reason why the assistantship should not be renewed? If there is a problem, has the GTA been duly advised of the problem (in writing), and given assistance in correcting the problem? If there's anything negative to report, please attach a detailed written statement.

   A. **reports from the GTA's supervising Faculty in the current semester** Include a formal Evaluation of GTA form (Appendix H) or a WVSU Classroom Observation Report.

   B. **report from the Thesis Advisor (MS students) or Program Coordinator (MA students)**

   C. **report from the Biology General Education Coordinator** (where appropriate)

   D. **report from Biotechnology Graduate Program Coordinator**

   E. **other reports** (ex. Dean of the College of NSM, other Graduate Faculty, Laboratory Manager)

Exhibit K: Recommendations from "Seminar for Teaching Assistants, Fall 2012

To improve graduate students' experience

1. Graduate students should be offered health insurance like most other schools offer. The GSA discussed this issue, leaving the precedent of the need to find a company that provides security for students.

2. Better instructions to receiving a fellowship and how to sign up for it. The creation of a blog for the biology department was the suggestion discussed. A blog or web page will allow the dissemination and publication of these and other similar issues. Initiative necessary to actually achieve this goal.

3. Dissemination of upcoming conferences, events and meetings that students can attend. *

4. Assign a grad student to each new coming International student to assist them in setting in moving around, and providing general help for the first few weeks until they can stand on their feet (opening bank account, social security number, driver's license, etc.)* An international student association is being created in the university. Possibly this recommendation can be taken to them.

5. RAs should be allowed to park near the building, parking spaces for students are very limited, and it is common that RAs bring samples in their cars. This issue was discussed extensively in class and made significant progress.

6. There should be some assigned paid jobs for the graduate students during summer. *

7. A higher stipend so more time would be able to be dedicated to studying or research instead of a part time job.

To improve teaching performance

8. A better performance might be achieved if laboratory manuals are provided at the beginning of the school year, instead of going lab by lab. If teaching seminar is going to be at the beginning of the week, and then it will be the student's responsibility to properly prepare the class, therefore, both the student and the leader instructor will have to agree and discussed the laboratory in advance.

9. It should be a requirement that the TA and instructor meet once a week to discuss upcoming labs, past labs or concerns.

10. TAs should be assigned their classes a few weeks before classes begin instead of just one week before. For this, professors with TAs should be organized and prepare along with the assistants and not just handing a book to students who never taught before.

11. Any lab being performed should be able to be completed within the specified lab time without rushing. Previous planning and correction of some labs are important aspects to consider for achieving this objective. And if recommendation 15 is accomplished, this will become an easy target to reach.

12. TAs should be assigned mainly first or second year courses. A graduate TA who is assigned a graduate class will be ineffective or at least TAs should not be assigned to classes that she/he has not completed and has to take, or in classes he/she is actually attending.. Recommendation 17 can complement this one. The presence of two TAs could help to overcome the deficiencies of one or the other.

13. TAs should be able to run the class for a decent amount of time, not for only 10 minutes. Professors should allow a moderate amount of time for the TA to run the class. Leaving only a small amount of lab time or professors taking over a lab can interfere with TAs learning experience.

14. TA should keep the same classes since they already know the labs and what needs changed or how to improve them as well as they would still have their lecture notes from the previous semester. *
    It was argued that the organization of schedules represents an inconvenient for this. However, the possibility of carrying out this recommendation can be evaluated more carefully, as there are many advantages for both, students and instructors.

15. Teaching seminar should be one of the first class to start the week. This is done!

16. There should be more TAs in the intro level biology courses or in classes that require long and complex labs (e.g. anatomy).

Under evaluation.

To improve the program's classes

17. A bioinformatics course, separated from the biotechniques and genetics courses. For achieving this goal internet access should be improved, for some reason, the internet failed several times during the bioinformatics module this semester.

18. More courses concentrated on medical topics or the human body for the students using the program to prepare for medical school. It was argued that the rotation, along with the demand of certain courses is the factors that define what courses are offered.

19. The program should have clearly defined course tracks, e.g. medical biotechnology, industrial biotechnology, agricultural biotechnology, pharmaceutical biotechnology etc., so that every student can specialize in his/her area of interest after the first year. The first year can be used for general/basic courses.

Other recommendations

20. Laptop locks and drawer keys should be provided for graduate offices.

21. More journal access on campus, access to the big science journals and find a way to update science books in the library. It was discussed the possibility of creating a reserve of books for the program courses and journals too, where books would be donated by teachers and students.

22. The university should open a host family forum where interested families can become hosts of international students. *

23. The university should build networks with the companies and other institutions so that the graduate students can rely on those organizations for summer internship.

24. T-shirts for the program participants. The GSA is working on this. *

*** additional recommendations**

Exhibit L: Recommendations from "Seminar for Teaching Assistants", Fall 2013

Shelter In Place Assessment
Dr. Ford
Teaching Seminar
Fall 2013

Background

This project is designed to examine the most important issue concerning the students this semester. While other projects were considered, this issue is the most important one to address. For instance, as a class we had already chosen the issue of health insurance for graduate students in the beginning of the semester. Then, something happened to make the class rethink their choice. It came on Wednesday, October 2, 2013 around 9:00am.

Two students were in the Biology Department Core Lab in Hamblin Hall talking with the Lab Manager, Mandy Bailey. The radio was on in the other room of the Core Lab. At first it sounded like the station was performing a test. The campus was silent. No sirens were heard. It was an ordinary day. The annoying test sound on the radio persisted. Mandy got up to hear the announcement. This was not a test. It was a real shelter in place.

Outside of Hamblin Hall looked like a normal day. The radio completed the announcement. The shelter in place area was extended to West Virginia State University. A brief discussion ensued. “Was that for us?” “Are they right?” “I don’t hear anything?” “Shouldn’t we hear the sirens?” “The radio said it was.” “It is an announcement for it.”

Finally, the two students and the lab manager headed to the designated shelter in place area. Was that the sound of a siren in the distance? Were they imagining hearing the siren now? A class was in session in room 107. As we passed the room, Mike notified the teacher that a shelter in place was called. There was a chlorine leak. The teacher seemed to ignore it. By this time, Jessica called her dad. Had he heard anything? Was there anything on the news about it? No and no. Her dad warned, don’t go downstairs. Chlorine is low to the ground. Go upstairs if you must stay there.

Still Mandy, Mike, and Jessica walked downstairs in the basement toward the shelter in place area. Once there, they joined others already in the Hamblin Hall Auditorium. As time progressed other classes started coming into the room. Other people came in while others walked out. Some people surfed the internet on their phones, texted, or talked on the phone. The noise level increased. While many people were gathered here, there was no direct announced statement of what was going on or what to do. Mandy said it was a chlorine leak. Others seemed to be saying the same thing including Dr. Magan.

The doors were covered with plastic and then held in place with duct tape around the edges. I sat toward the back. Now, I was beginning to rethink my setting in the back of the room. The plastic filled and swayed with air puffing out into the room and then deflating. This process kept repeating. It may have been covered, but it sure was not sealed. People arrived later and later. The doors opened and closed. Finally, they appeared to be taping the main doors. Jessica sent out a quick text or so. Others in South Charleston were sheltering in place. It must be real. Why were they not moving them to a higher room? Not all emergencies require the same response.

She sent a text to Dr. Guetzloff. He is on the West Virginia State University Board of Governors and a Chemistry professor at State. It is what she calls a life insurance plan. In the event of her death from chlorine related complications, it proves she was sheltering in the basement, a chemist was there, and the school was sticking with the designated shelter in place area. “Is not chlorine low to the ground? Why are we not in a higher place like the 3rd floor?” (Her text went forever unanswered.)

She was sure that her parents should be able to get access to her texted messages. In the event of her death, the negligence on the school’s part and a nice body count in the basement is every class action lawyer’s dream. She was sure her parents were far enough away from the site that they would live. She smiled as she sent her text. She knew these areas were for the body count anyway. Her parents would probably get some money. A nice class action lawsuit later for the school, and there would be her life insurance plan.

Introduction:

Thankfully, no one at State was seriously harmed by the events of October 2, 2013, but it did change the emphasis for the semester project for this class. Sheltering in place in the basement is not the best idea for all types of chemical emergencies. There are many different types of chemicals, and many different reasons to have a shelter in place. Shelter in place emergencies are not always chemical related, but time matters. These are not

all the same nor should their response be the same. The background in this paper is what changed the destiny of the project to move from health insurance to shelter in place emergencies.

Several areas definitely could have used improvement. First there was a problem with communication. Had the radio not been on in the Core Lab, those parties may have never known. Secondly, there are certain labs and classrooms in Hamblin Hall that are dead zones to the shelter in place alarm. Anyone in these areas cannot hear the alarm. In a true emergency situation, these individuals might not make it out alive. It is important to remember that for all appearances, things seemed normal outside. The problem lies in that in classrooms or labs, radios are not typically turned on. This reduces one way that the message could be delivered on impending danger and the need to shelter in place.

The school has email and text programs to inform students, but the email was sent out about the emergency after it was over. While I do appreciate the school trying to send out notifications, it does not make the school look professional when the shelter in place email goes out after the shelter in place warning is over. It makes it appear unorganized in the response plan the school has. The shelter in place lasted for about an hour. While it is a good idea to have email and text notification systems for the school in emergencies, these will not solely reach the student population. Some students will not have home access to the internet. More importantly, there are students in a class that do not have access to the internet. (Yes, some have smart phones that are capable of receiving their email, but this is not the case for everyone.) Another issue is that during class students are expected to have their cell phones turned off. While I have set in class where my instructor's or other student's phones ring or beep, I generally keep my phone off if I am in class.

Most every professor I have ever encountered in class have very specific statements in their syllabus that denote the importance of students keeping their cell phones off or on vibrate so as not to disturb the class. (Having taught lab classes, I know from the number of students who glance at their phones, many students likely have their phones on during class.) Still this issue is that if people are in class it is reasonable to assume that they are not receiving updates about the shelter in place.

Please keep the school's warning system that notifies via social media though. Not all students will be in class at any given shelter in place. So, these people will benefit from the email and or updates via twitter. Social media is one way to address the public, but there are still people who don't have twitter, instagram, or facebook. For these individuals affiliated with the school the siren is the best method we presently have on campus to notify them. What about students that are physically disabled such as students who are deaf? This is a question that I have struggled with for a long time.

(Back in 2000 I was a lab assistant in the English Department.) We had a student who was deaf. I took sign language, because of that student. It started when we had a planned emergency drill of shelter in place during his class. I had to make sure everyone was out of the room and lock the door. His classmates heard the siren and left. He sat at the computer. He looked at me. I mouthed the words to him slowly that we had to leave. Finally, I wrote on paper for what seemed like a long time. "We are having a shelter in place drill. We need to leave the room and go to the auditorium." He then nodded and got up to comply with the drill. It bothered me that in the time spent writing what was going on, he could be dead. I took sign language after that so that I could communicate to him as soon as it happened. There was never another shelter in place with his class again. Is there a way to notify the deaf or those that are hard of hearing of pending shelter in place emergencies or drills?

A fast response is the best response. Swift action in emergencies can save lives. While we are trained not to panic, it is important to have prescribed and thought out responses to emergencies. Where is all of the shelter in place locations throughout the campus? They are labeled as designated areas in the buildings, but do we know from building to building?

Now, for the location, should people enter and leave. I don't think so. It is not just a 'hey we are out of class' phenomenon. While it may be treated like it is a joke by some students, it is not. Entering and leaving brings about the potential of contaminated air in a chemical leak. Also, at some point the doors are taped. So entry or re-entry becomes an issue. One additional problem is what can be done to make sure that the ventilation system is not compromised. Taping is not working, if the air coming in pushes out the plastic. This is not safely sealed. It may be duct taped, but it is not a fit seal. Also, what about water, food, and restroom facilities? These are possible reasons that people left the room and then re-entered. I realize that a modern response requires lots of money and time, but it is also a good investment. Proper planning prevents poor performance. Would overcrowding of the room ever be an issue? This could be a possibility considering the amount of students in the building at peak hours in the day. It is our understanding that the freshman BIO 120 class is at around 100 students this semester. Now factor in the other classes going on, the visitors, the staff and faculty, and researchers, and this could be a possible overcrowding situation.

Problem Statement:

The problem is defined as the shelter in place emergency response plan and the implementation of communication and call to action on the emergency response plan for shelter in place as it appears at West Virginia State University.

Comparisons:

For this component, other schools were examined for their shelter in place plan. Marshall University and West Virginia University Institute of Technology in Montgomery, WV were examined. Additionally, WVSU was compared to these other institutions. Of the reviews, Marshall and WVUIT had emergency response materials online. WVSU had an article online talking about a planned shelter in place drill in 2012, and the use of the schools WARN system. The warn system is the system that notifies via email and social media. Marshall's plan looked heavily beaucratic in nature and was difficult to navigate as to how their shelter in place system worked. Due to the Cleary Act, they publish a document every year detailing safety and emergency procedures. One area of interest was their plan from quick action in the event of an emergency to get the school back up and running again. It seemed to be geared in a chain of command, and how to get back to business type format. One interesting point in their document (Annual Security and Fire Safety Report) was their description of each of their buildings and what the buildings were made of. This was then placed into classes based upon what those materials were.

By far the best of the websites was provided by WVUIT. Their emergency response materials were readable and easy to locate. A quick search brought about their documents of shelter in place and every other kind of emergency that could occur (Emergency Response Plan). It starts on page 32 and continues. Page 41-42 have the most pertinent information for shelter in place. It is thoroughly addressed and discusses what will happen and why it occurs. They have designated media areas for discussions with local media and define the local media. They have multiple rooms within a building and do not shelter on the ground floor (only higher).

Recommendations:

It is with pride and humble submission that we, the teaching seminar class of fall 2013, give you the recommendations for the shelter in place.

- <u>Improve Communication</u>

Send out timely emails and texts or twitter feeds immediately announcing the call for a shelter in place – preferably when the county emergency response is notified. Tying these into the county system would incur faster communication of the problem and where the problem is located. Send out communications as above detailing the end of the shelter in place and give any pertinent details such as what was leaked or why the shelter in place occurred.

Make the sirens louder. By increasing the volume of the sound on the sirens, perhaps it could be heard in more areas. Seriously, we cannot hear it in parts of our building.

Place more sirens strategically throughout campus. With the placement of more sirens, it provides better coverage for the siren to be heard throughout campus.

Place a strobe light with the sirens. So that light can be seen along with the sirens on campus. We know that the sirens are mounted atop buildings, but this adds to the importance of what is going on. It also should get people off of the sidewalks and into the appropriate shelter in place area.

Inside buildings, tie the siren outside into a sound system inside. Make the sound emit within the building as well as flash strobe lights. This is tricky as it must not resemble a fire alarm.

- <u>Provide</u>

Provide custom fitted door covers for the doors. Then, tape them. This cuts out the air flow into the room that should not have air flow. Oxygen needs to be available also. Oxygen is flammable, but a sealed room must not run out of oxygen, or you defeat your purpose of sheltering in place to begin with: safety.

Provide food, water, and restroom facilities. Might we recommend a water fountain or bottled water and camping portable toilets with biohazard bags? We have no food recommendations at this time due to possible food allergies. Either way, something simple, or what could be on hand in case anyone in the room is diabetic.

Have emergency supplies. In the event that someone should get sick. Advil, Tylenol, Band-Aids, etc.

- Clarity

Post a clear and concise plan for students to follow for emergencies like a shelter in place plan on the website for all to view. Don't bury the thoughts in technical jargon.

Let students know their rights. This should not have to be stated, but it happened in the last emergency. So, clearly state that no instructor has the right to make students stay in a class for any reason when there is a shelter in place emergency. Period. Your life is more important than a test ever is anyway, even though you may not think so at the time. (No rioting or disrespectful behavior is necessary. Hear a siren? Leave the room. Quietly and politely.) I'm not being mean here, but a dead student is likely going to result in a lawsuit. We already face budget cuts and don't need this.

Clearly provide an online map showing the shelter in place areas for each of the buildings on campus and the different room numbers for shelter in place.

Develop a clear response plan for aid to individuals that may be deaf or hard of hearing. No one should be left alone in a room wondering what is going on. This demographic of the population is a personal worry to me. Would the flashing light and the siren address this inside of the building?

Training is essential. Can there be training on proper and fast response to get students moving to designated areas for shelter in place? Would this be helpful or perceived as a waste of time?

- Examine the Situation

Have a varied emergency response plan based upon what is causing the emergency to begin with. All emergencies are not the same, so don't treat them that way.

Have multiple rooms for shelter in place in different locations of the building. These rooms must be connected via telephone for communications.

Different locations in the same building are used for the type of chemical spilled or the amount of students needing room space to shelter in place.

Record names of all persons in the rooms (everyone) and report out to a main building database, should names and physical number of people need to be accounted for.

Conclusions:

In conclusion, we the students of this teaching seminar class realize that this is not an exhaustive list of possible changes that could happen, but we think these are the best suggestions that we can come up with at this time. We know there is a meeting on campus next week for a discussion on how the shelter in place system can be improved. Through discussions with Dr. Magan, we learned that this committee was established by the President of WVSU, Dr. Brian Hemphill to discuss and review the present protocol. This is a fantastic start.

From Dr. Magan, it is our understanding that these protocols and procedures have not been updated for 10 years. It is clearly time to think of what could be changed for the better in addressing the shelter in place. Some criticism appears to be that the administration does not give the Shelter in Place proper attention. We applaud Dr. Hemphill and the faculty and staff presently for their concern in addressing and reviewing this matter.

Please note that these suggestions we have submitted for review above are clearly issues as we see them. Some of our suggested ways of dealing with them may not be the most feasible or cost effective. We respectfully submit this to you for review. As per the proper flow of information, this document has been submitted to Dr. Richard Ford for review. At present, this document is not meant to be circulated to any other person, official, or campus office unless deemed necessary by Dr. Ford and at his sole discretion.

If at any point this document would be requested for the students to circulate, it would follow proper protocol in its distribution. First to the instructor (Dr. Ford), then to the appropriate chair depending on the request (Dr. Ford if graduate program; Dr. Chatfield if Biology program; and so forth), then to the appropriate dean (Dr. Harper if in the College of Natural Science and Mathematics).

We welcome any discussion involving comments, questions, complaints, or general inquiry in our semester project.

Exhibit M: Questions Asked of Candidates to the Biotechnology Graduate Program During Skype Interviews

January 17, 2015

1. Can you see and hear us?
2. Be notified that we are saving a screen shot of you, for identification purposes.
3. What name shall we call you?
4. What time of day/night is it where you are?
5. Tell us about your educational background.
6. What courses have you taken that have especially prepared you for graduate study in Biotechnology?
7. What research experience do you have (ex. as part of coursework, in a research lab)?
8. What teaching experience do you have (ex. classroom teaching, tutoring, one-on-one lab instruction)?
9. What area(s) of Biotechnology are you interested in?
10. Where do you see yourself in 10 years? That is, what are your professional goals and aspirations?
11. How did you hear about the WVSU Biotechnology Graduate Program?
12. What do you do for fun in your spare time?
13. What questions do you have for us?

Exhibit N: **Graduate Student Checklist** *form Spring 2014*

---

name _____ MS or MA track _____

Application Materials

_____ Application for Admission
_____ Statement of Purpose
_____ Letter of Reference 1
_____ Letter of Reference 2
_____ Letter of Reference 3
_____ GRE: verbal 140, quant 150 ..... goes to admissions or Mary Wickiser
_____ application fee: $34 (AY 2013 - 2014)
_____ Letter of Intent

international applicants:

_____ *transcript evaluation ..... goes to admissions?*
_____ *TOEFL or IELTS ..... goes to registrar*
_____ *affidavit of support*
_____ *proof of immunization: MMR, Hep B, meningococcal meningitis*
_____ *Skype interview*

---

semester started in the Program _____

Orientation and Safety Seminar (date) _____

What deficiencies / remediation must the student do, in addition to normal Biotech coursework?

_____

signature of **Faculty Advisor** and date (MS only) _____

signatures of **Thesis Committee (MS)**

_____ _____

_____ _____

Graduate Coursework MS needs 30 credits, MA needs 36 credits

Core Courses MS and MA need 12 credits

BT 511	Seminar	1 credit	_____
BT 511	Seminar	1 credit	_____
BT 555	Statistics	3 credits	_____
BT 567	Current Concepts	3 credits	_____
BT 571	Biotechniques I	2 credits	_____
BT 572	Biotechniques II	2 credits	_____

Electives MS needs 12 credits, MA needs 24 credits

BT 501	Teaching Seminar	1 credit	_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____
_____			_____

Research MS needs 6 credits

BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____
BT 695	Master's Thesis Res.	_____	_____

Teaching (MS and MA) All students must have taught at least two sections.

_____ _____

signatures of **Committee approval of Plan of Study** (MS and MA)

_____ _____

_____ _____

Committee signatures of **approval of thesis proposal** (MS)

_____ _____

_____ _____

Committee signatures of **approval of Thesis Writing Plan** (MS)

_____ _____

_____ _____

Committee signatures on **public presentation of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Committee signatures on **oral defense of thesis research** (MS) indicate pass or fail

_____ _____

_____ _____

Coordinator's signature on **comprehensive examination** (MA) indicate pass or fail

_____

signatures of Advisor, Committee, Coordinator and Dean signature page on **completed thesis** (MS)

Thesis delivered to Library (MS) Library issues a Master's Thesis Deposit Receipt. Keep a copy in the file.

Advisor's **letter recommending student for graduation** (MS) Keep a copy in the file.

Coordinator and Dean **letter recommending student for graduation** (MS and MA) Keep a copy in the file.

Biology Lab Manager signature says all **Biology Department keys have been returned**. (MS and MA)

_____

Please leave **contact info** with Ms. Glenna Curry so we can keep in touch after you leave WVSU.

Exhibit O: Graduate Certificate in Biotechnology

A "Graduate Certificate in Biotechnology" from the West Virginia State University Biotechnology Graduate Program is earned by completing and passing the following courses:

1. Biotechnology Seminar (BT 511) ... taken twice	1 credit each	
2. Biostatistics (BT 555)	3 credits	
3. Current Concepts in Biotechnology (BT 567)	3 credits	
4. Techniques in Biotechnology I (BT 571)	2 credits	
5. Techniques in Biotechnology II (BT 572)	2 credits	..... 12 credits total

A student may count no more than two (2) final grades of "C" toward the certificate, and must have a GPA of 2.5 or better in these 12 credits.

Entrance requirements are: an undergraduate degree in a related field, an undergraduate GPA of at least 3.0 (on a four-point scale), TOEFL scores where appropriate of at least 550 (or at least 79 on the computer test), and approval of the Biotechnology Graduate Faculty. The Biotechnology Graduate Faculty may, under special circumstances, waive any of the other entrance requirements, including course prerequisites.. It is understood that students entering the Graduate Certificate in Biotechnology program have a current knowledge of the fields of Cell Biology / Physiology, Genetics (Classical and Molecular), and Chemistry (at least three semesters of college-level Chemistry).

Course transfers and course substitutions are to be decided by the Biotechnology Graduate Faculty, with the certificate candidate being responsible for providing any supporting documentation. No more than four (4) credits may be transferred from another institution.

This Certificate program will take effect in the Fall 2011 semester. However, students may apply these courses (with acceptable final grades) taken in previous semesters to certificates to be awarded in Fall 2011 or later semesters. All courses to be applied to the Graduate Certificate in Biotechnology must be completed within five (5) years of the semester in which a the student starts the program.

The University will charge no fee for awarding a Graduate Certificate in Biotechnology.

For more information, contact the Coordinator of the Biotechnology Graduate Program

Dr. Richard Ford
101D Hamblin Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-5742 fordri@wvstateu.edu

To apply, contact the Director of Registration and Admissions

Ms. Donna Hunter
127 Ferrell Hall, WVSU
Box 1000, Institute WV 25112-1000 304-766-4146 hunterdl@wvstateu.edu

Exhibit P: Instructional and Research Facilities Used by Biology Department / Biotechnology Graduate Program

Room	Description	Comments
002	330 sq. ft. conference room; seats 16; LCD projection	Departmental and other meetings; seminars
003	Temporary waste storage facility; fume hood flammable storage	Used by Research, Biology, Chemistry and Physics
005	720 sq. ft. classroom with tables seats 48+; LCD projection	Used by Biology and Chemistry
007	Hamblin Auditorium; seats 140; smart podium	Classes, conferences, campus – wide meetings
020	Biology department storage; -80°C freezers; drying oven	
024	Aquaculture research storage	Dr. Eya
026	Aquaculture research lab:	Dr. Eya
H101	Natural Sciences and Mathematics office suite	Also Biology Department office
H101D	Faculty Office	Rich Ford
102	1184 sq. ft. research lab; fume hood; GC, incubator	Dr. Huber environmental microbiology research
106	240 sq. ft. student computer lab; 5 desktop computers Large table, chairs, couch	Available during regular campus hours for use by any student;
107	Classroom with tables; seats 48+; LCD projection	Used by Biology and Chemistry
126	312 sq. ft. digital microscopy research dry lab; specimen storage and preparation	Dr. Ruhnke tapeworm specimen and microscopy lab
128	Staff Office	Seats 4; technicians, postdocs
130	154 sq. ft. prep lab with 2 autoclaves, EPure water purification system and ice machine	General use for all instructional and research activities
131	Faculty Office	Ms. Fletcher
132	110 sq. ft. dark Room and imaging center	
133	Faculty office	Dr. Collins
134	1008 sq. ft. instructional wet lab; 24 fixed stations; LCD projection; incubators, refrigerator	Microbiology, Genetics, Cell Biology, Biotechnology instruction
135	Faculty Office	Dr. Ruhnke
136	256 sq. ft. wet lab with clean hood; anaerobic hood	Huber and Reddy shared research space
137	Faculty Office	Dr. Eya
138	Graduate student office	Seats 6
139	Faculty Office	Dr. Huber
140	1080 sq. ft. instructional wet lab; six benches with 30 fixed stations	Human A&P instruction
141	Faculty Office	Dr. Reddy
142	Instructional core facility; overflow research lab space for Ruhnke group	Prep for labs
144	282 sq. ft. stock room and academic lab manager's office	Mandy Bailey
145	Research lab; fume hood; mini digesters	Dr. Huber: Environmental Microbiology research
201A	Research lab; digital microscopy	Dr. Collins
201B	171 sq. ft. headhouse	Greenhouse prep
201C	300 sq. ft. greenhouse	Generally used for instruction; some research
202	684 sq. ft. research lab; fume hood	Dr. Chatfield plant physiology research

203	1026 sq. ft. instructional wet lab; 24 fixed stations	Botany, Ecology instruction
205	958 sq. ft. instructional wet lab with tables; seats 24; LCD projection	General Education Biology instruction
207	1062 sq. ft. 959 sq. ft. instructional/research lab; 18 fixed stations; fume hood; clean hood; centrifuge; refrigerator; LCD projection	Biotechnology, Biochemistry instruction
208A	Graduate student office	Seats 2
208B	Post doc and tech office	Seats 2
209	1134 sq. ft. instructional wet lab with tables; seats 30; LCD projection	Introductory Biology Nutrition and service course instruction
211	Faculty Office	Dr. Harper
212	676 sq. ft. classroom with desks; seats 45+; LCD projection	Mostly used by Chemistry; occasionally used by Biology
214	Microscope lab;	Temporary visiting scientist office
216	140 sq. ft. zoology specimen storage wet lab	
218	885 sq. ft. instructional wet lab; 24 fixed stations; LCD projection	Zoology, Evolution instruction
219	Faculty Office	Dr. Chatfield
227	Faculty Office	Dr. Hankins
230	240 sq. ft. research lab; fume hood	Dr. Hankins tumor biology
232	432 sq. ft. research lab; fume hood	Dr. Hankins tumor biology
301	324 sq. ft. research instrument lab	Drs. Padma and Reddy genomics
303	405 sq. ft. shared research lab; fume hood	Drs. Padma and Reddy genomics
305	572 sq. ft. shared research lab; fume hood, clean hood, PCR lab	Drs. Padma, Reddy, Harris and Hankins genomics, muscle physiology
306	Graduate Student Office	Seats 6
309	624 sq. ft. research lab; fume hoods (2)	Dr. Eya metabolomics and fish physiology
330	312 sq. ft. research instrument wet lab; LC, incubator	Dr. Padma and Dr. Reddy genomics

Exhibit Q: Equipment in the Biotechnology Graduate Program

January 17, 2015

1 ABI 3130xl Genetic Analyzer
2 Advance analytical Fragment analyzer
3 Agilent Bio Analyzer 2100
4 Applied Bio systems Step One-plus RT PCR
5 Applied biosystems Thermal cyclers-2720 (7)
6 Belly Dancer shaker
7 Bransonic Sonicator
8 Circulating Water bath
9 DNA Concentrator Labconco
10 Eppendorf Centrifuge -3430
11 Eppendorf Centrifuge 5415 (Small)
12 Eppendorf Centrifuge 5424 (Small)
13 Eppendorf -Centrifuge 5810 (40c)
14 Eppendorf Thermal Cycler
15 Eppendorf Thermostat Plus
16 Fisher Scientific PH meter
17 Flourchem Gel DOC
18 Gel Electrophoresis Units-large(4), medium (4)and mini(10)
19 Hybridization Oven
20 Speed Vac-DNA concentrator
21 Kinamatica Homogenizer
22 Labconco Vaccum Freze Dryer
23 LICOR 4300 DNA Analyzer (2)
24 Licor Odessy
25 Mini centrifuge
26 MicroArray Scanner
27 Mupid Gel Electrophoresis units (4)
28 Nanodrop-1000 Spectrophotometer
29 NanoPure-Water purification system
30 NUAIRE Sterile Work Bench
31 Partec ploidy analyzer
32 Qiagen Tissue Lyser
33 Qivac 96 well vacuum filtration
34 Roche tissue Lyser
35 Speedvac centrifuge
36 Trinean Xpose spectrophotometer (DNA Quantification)
37 Vortex
38 Water bath (3)
39 Waters 1525 Binary HPLC
40 Zeiss bright field microscope
41 Zeiss Epi-fluorescence Microscope
42 Zeiss Stereo Microscope
43 Zeiss working Microscope
44 Freezers -80 (4)
45 Freezers -20 (4)
46 Zeiss Axioskop II with drawing tube and fluorescent capabilities and attached digital imaging system
47 Leica EZ stereoscope with digital imaging system
48 Two BioRad PCR systems in Core Lab
49 ABI Prism 7000 sequence detection system
50 Class II A2 laminar flow safety cabinet
51 Leica DM LS research microscope
52 Olympus IX-71 Inverted Fluorescent Microscope with Regita CCD camera
53 ONO-301D microinjection/micromanipulation workstation

54 Leica DMIL inverted fluorescent microscope
55 Alliance HPLC system with 2998 photodiode array detector
56 Odyssey infrared scanner
57 four carbon dioxide chambers
58 Flexercell FX4000 cell stretch apparatus
59 Flexercell streamer fluid shear stress unit with OsciFlow flow controller
60 BioTek Synergy HT multi-detection microplate reader
61 BioTek Cytation 3 cell imaging multi-mode reader
62 ABI Prism 7500 real-time PCR system
63 Roche 454 Junior next-generation sequencing system
64 Thermo Fisher Arena 60 Automated Discrete Photometric Analyzer System
65 Centrifuges include RC-5B refrigerated centrifuge, Eppendorf 5810R centrifuge with swinging plate/bucket rotor, and micro centrifuge
66 Spectronic Genesis 2 UV/VIS g spectrophotometer with a temperature controlled 8-cell blocks and available enzyme kinetic software
67 Leco Truspec Nitrogen Analyzer
68 Leco AC-350 bomb calorimeter.
69 Instech Fiber Optic Oxygen monitor for mitochondrial respiration measurement
70 Tissue Lyser II with tungsten carbide beads, 96 well 3 mm bead dispenser, and adapter sets
71 three recirculatory systems for aquaculture, each with 12 152-gallon aquaria. each system has a 100-gallon sump, ploygeyser bead filter, UV light filter and heat pump
72 Aquatic Biosystems Jumbo Cartridge de-chlorinator

Exhibit R: Assessment Plan for the Biotechnology Graduate Program, 2012
Master of Science / Master of Arts Combined

Assessment of the Biotechnology Program at WVSU is measured based on five **Program Learning Outcomes** (PLOs) and three of WVSU's Guiding Values (GV):

1. WV-WVSU-BioD 1.1 SCIENTIFIC METHOD: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.

2. WV- WVSU-BioD 2.1 LABORATORY SKILLS: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.

3. WV- WVSU-BioD 3.1 CONTENT: Demonstrate an understanding and proficiency in one of the specialized areas of study: organismal/environmental or molecular/microbial.

4. WV-WVSU-BioD 4.1 SCIENTIFIC ISSUES: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.

5. WV-WVSU-BioD 5.1 COMMUNICATION SKILLS: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. WV-WVSU-GV.1 Academic Excellence

2. WV-WVSU-GV.4 A core of student learning that includes effective communication, understanding and analysis of the interconnections of knowledge, and responsibility for one's own learning.

3. WV -WVSU-GV.6 Development of human capacities for integrity, compassion, and citizenship

An evaluation will be made in three of Biotechnology's core curriculum courses. An early assessment will be made in BT 511, continuing with a middle assessment in BT 567, and a final assessment in BT 572. Data collection of students' performances in these courses concerning final grade, cumulative exams, written and oral presentations, laboratory assignments, comprehensive MA final, and Master Thesis
and public presentation will follow. This system will be implemented fully, rather than phased.

Data concerning lecture and laboratory materials will be combined to determine a final grade. Students will be assessed based on their general understanding of lecture materials through a final grade compiling assignments such as exams, quizzes, and written assignments. This component addresses Biotechnology PLOs three, four, and five. Students will also be assessed based on their laboratory skills including hand-ins, write-ups, quizzes, experimental reports, and independent presentations. This component addresses numbers one, two, and five of the Biotechnology PLOs. Both components cover all three WVSU Guiding Values. Students will receive a score of one through three based on their overall percentage in each component. Exemplary work (100%-90%) will receive a four, acceptable work (89%-80%) a three, and work that is unacceptable according to program requirements (69% and below) a one.

A cumulative exam will be used to assess students on their knowledge of topics presented in lectures throughout Biotechnology courses 511, 567 and 572. This data strongly assesses PLO number three along with the three Guiding Values. Data will be collected via a rubric identical to the one seen in final grade assessment. An additional assessment will be conducted upon completion of a comprehensive Masters of Arts final. This assessment will be made much like the cumulative exam.

All students in BT 511, 567, and 572 will be subject to data collection concerning their ability to write a concise, well-constructed paper and/or their ability to give an audible, informative presentation. Each of these components of the third assessment assignment addresses PLOs two through five including the three WVSU Guiding Values. Assignments will be graded on content knowledge, grammar /spelling, organization, references, and oral presentation skills. Each constituent graded on a scale of one to three, exemplary to not acceptable. An additional assessment will be conducted upon completion of a Masters of Science thesis and public presentation. This assessment will be made much like the written assignment and oral

presentation.

The program's final course assessment is based on the student's skills in BT 572. They are expected to complete a laboratory report that is concise, informative, and knowledgeable using a standard format. This task addresses Biology PLOs one through five and each of the three WVSU Guiding Values. Assignments will be rated one to three on the following: components, procedures, diagrams, content knowledge, spelling/grammar, and references and graded on a 3-point rubric.

Collection of data will be completed via LiveText.com. Each instructor of the evaluated courses has set up a LiveText account and will be able to access assessment rubrics accordingly. Final grades for the Fall 2011 Semester will be submitted and full, comprehensive data will be collected for Spring 2012.

Exhibit S: Assessment Map for the Biotechnology Graduate Program, 2012

course, lab, hours	PLO #	**Assessment 1** Final Grade what, when	**Assessment 2** Cumulative Exam what, when	**Assessment 3** written / oral presents what, when	**Assessment 4** Lab assign what, when
Biotech Seminar BT 511 no lab 1 hour	1, 2, 3 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	NA	final paper oral presentation Week 15	NA
Biostatistics BT 555 no lab 3 hours					
Current Concepts BT 567 no lab 3 hours	1, 2, 3 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	cumulative final Week 16 PLO 3	research proposal oral present PLO 2, 3, 4, 5	NA
BioTechniques I BT 571 lab 2 hours					
BioTechniques II BT 572 lab 2 hours	1, 2, 3, 4, 5	final grade end of semester PLO 1, 2, 3, 4, 5	cummulative final Week 16 PLO 3	independent project design PLO 2, 3, 4, 5	lab report data present, analysis, PLO 1, 2, 3, 4, 5
Seminar for TAs BT 501 1 hour					

Exhibit T: Assessment Timeline for the Biotechnology Graduate Program, 2012

YEAR	SEMESTER	COURSE-LEVEL PLOs ASSESSED	TOOLS
Year 1	Spring 2012	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2012	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 2	Spring 2013	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2013	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 3	Spring 2014	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2014	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 4	Spring 2015	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2015	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation
Year 5	Spring 2016	Biotech 511	MS Public Presentation

			Final Paper
			Presentation
		Biotech 572	Cumulative Final Exam
			Independent Project Design
			Lab Report
	Fall 2016	Biotech 511	MS Public Presentation
			Final Paper
			Presentation
		Biotech 567	Cumulative Final Exam
			Research Proposal
			Research Proposal Presentation

Academic Affairs Assessment of Student Learning

Report for Academic Year *2013-2014*

Department/Program Biotechnology MS MA

Program Learning Outcomes Developed in AY 2010-2011 (attached pdf).

1. Scientific Method: Application of the scientific method to devise, test, and evaluate scientific hypotheses regarding natural phenomena related to biological topics.
2. Laboratory Skills: Effectively use scientific equipment and techniques, and computer and library resources to obtain information and solutions to problems related to the discipline.
3. Content: Demonstrate an understanding and proficiency in one of the specialized areas of study: Organismal/Environmental or Molecular/Microbial.
4. Scientific Issues: Understand and discuss current technological and environmental problems, their impact on society, and the role of science and technology in addressing them.
5. Communication Skills: Demonstrate the ability to effectively communicate verbally and in writing to the intended audience.

1. Which learning outcomes did you measure this past year? [Please indicate whether any of these measures were conducted as follow-up to a previous year's issues or in response to Program Review. Be specific.]

The previously developed PLOs for the Biotechnology graduate program were never utilized. Five types of assessment were identified in three courses. Three of the assessment types were based on final grades in the courses. The other two assessments were to evaluate written and/or oral communications of an assignment or the MS thesis. While rubrics were developed for these two assessments, who would undertake this component was not determined.

2. In which course(s) were assessments conducted?

None during academic year 2013-2014.

3. How did you assess the learning outcomes (s)? (i.e., method and tool, e.g., rubrics, national norms, item analysis, sampling, student projects, presentations, exams, etc.)

None during academic year 2013-2014.

4. Who analyzed results and how were they analyzed? (Committee, assessment liaison, department faculty, statistical review vs. benchmark, Live Text, etc.)

None during academic year 2013-2014.

5. Summarize results/findings/conclusions. (Data analysis)

None during academic year 2013-2014.

6. What are next steps? (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)

With guidance from the university, the assessment team for the biotechnology program developed new PLOs in the fall of 2014. This plan was unanimously accepted by the graduate faculty in a motion made at a program meeting September 5, 2014. Plans are being made to create the necessary rubrics that will be presented to the graduate faculty at the next meeting (September 19). We plan to share the rubrics with our students to acquaint them with the faculty expectations of successful graduate students. This new plan will allow us to assess students both early and late in the program, to identify gaps in our program and to allow improvements, changes and additions to improve the program.

Exhibit V: Assessment Plan for the Biotechnology Graduate Program, 2014

Academic Affairs Assessment of Student Learning

Draft Plan for Academic Years 2014-2015 and 2015-2016

Department/Program Biotechnology (MS and MA)

Program Learning Outcomes

1. Demonstrate ability to use the scientific method to address problems germane to the field of biotechnology
2. Demonstrate their ability to communicate professionally with fellow Biotechnologists, in both written and oral form, at a level appropriate for those with a Master's degree in the discipline.

Curriculum Map

	PLO#1 Demonstrate ability to use the scientific method to address problems germane to the field of biotechnology	PLO#2 Demonstrate their ability to communicate professionally with fellow Biotechnologists, in both written and oral form, at a level appropriate for those with a Master's degree in the discipline
BT 567 Current Concepts	X	X
BT 571 Techniques in Biotechnology I		
BT 572 Techniques in Biotechnology II		
BT 555 Biostatistics		
BT 511 Seminar (first time) BT 511 Seminar (second time)	X	X
Thesis (MS)		
Oral Defense (MS)		
Comprehensive Exam (MA)		

1. Outline which learning outcomes and where you expect to conduct measures over the next 2 academic years (falls and springs) Include rationale, e.g., trending data, planned/ongoing follow-up from previous assessments or program review cycle, etc.)

Fall 2014

BT 567 Current Concepts in Biotechnology: PLO#1 and PLO#2 will be measured from the course project of a grant proposal with a rubric for each that will be shared with the students. This is a new measure to assess use of the scientific method and communication skills of all students in the Biotechnology program. BT 567 is offered every fall, so students take it in their first or second semester in the Program.

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Spring 2015

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Fall 2015 Data from the 2014-2015 academic year will be reviewed by the assessment team during the summer of 2015 to evaluate implementation of the new assessment plan, measures used, trends if they can be identified and recommendations for modifications necessary prior to the 2015-2016 academic year. This information will be shared with the graduate faculty and invited parties at one of the first departmental meetings of the new academic year. If no modifications are proposed the following courses will be assessed as listed:

BT 567 Current Concepts in Biotechnology: PLO#1 and PLO#2 will be measured from the course project of a grant proposal with a rubric for each that will be shared with the students. This is a new measure to assess scientific method and communication skills of all students in the Biotechnology program. BT 567 is offered every fall, so students take it in their first or second semester in the Program.

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

Spring 2016 Unless recommendation to the assessment plan are proposed in the Fall of 2015, the assessment plan will be as follows:

Biol 511 Seminar: PLO#1 and PLO#2 will be measured in the course project with the same rubrics used in BT 567. This is a new measure to assess outcomes of the project of our graduate students in the end of their coursework. Students must take BT 511 twice, and they will henceforth be

required to take the second iteration (which includes the assessment) in their last or penultimate semester in the Program. BT 511 is offered every semester.

2. How are you planning to measure the learning outcomes (s)? (What object, i.e., test, project, presentation, etc., and with what tool, e.g., rubrics, item analysis, sampling, benchmarks, national norms, exams, juried review, etc.)

Objects to be used in measuring the PLOs are projects including use of the scientific method and communication skill components. The object in BT 567 will be a grant proposal, written and presented orally in class. The object in BT 511 will be a project in which students (in written and oral form) investigate a current problem in Biotechnology, design proposals to address it, and discuss/defend their ideas. Tools will be rubrics to measure student projects. This assessment plan may also change after the first year of implementation if insights are gained that support changes.

3. Who will be responsible for the analysis and how will results be analyzed? When will results be available?

All graduate faculty are expected to be engaged in understanding and participating in this assessment plan which was unanimously approved on September 5, 2014 in a departmental meeting. The assessment team including the Program Coordinator has specific responsibilities to implement this plan and will lead the collection and analysis of data with graduate faculty colleagues and invited participants to be involved as requested. The assessment team will meet in January 2015 (and each January thereafter) to verify collection of all data from the fall semester and put measures into place to collect the spring term data. Data will be analyzed for the year after the spring term when all the data are available. A summary including any trends and recommendations will be presented in a faculty meeting early in the fall term. Modifications to the assessment plan, based on assessment data and analysis by the assessment team and other faculty, will be recorded in minutes of departmental meetings.

Exhibit W: Committee on Expectations, Standards and Assessment Members, Spring 2011

February 7, 2011

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undergraduate student representative (name withheld)

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Exhibit X: Committee on Expectations, Standards and Assessment
Overview of Plans, Activities, and Results

January 4, 2015

recommendation / plan	**status / result**
CESA evaluates Biology and BT	curriculum, facilities, equipment (etc.) discussed student advising was thoroughly reviewed
CESA active in assessment	never really took off
by helping develop and analyze exit exams	discussed but not done
by developing employer and alumni surveys	discussed but not done
employer / alum survey (on-line, ongoing)	no
undergraduate internship course	yes
NSM Alumni award	no
get database for regional secondary schools	no
activities to include alumni	a few done: invite to semesterly luncheons notify of public seminars
testimonials by alums	no
join WV Bio	no
improve public relations presence	
make advertising posters	no
make promotional videos	filmed, but never released by WVSU
improve web page, do a Facebook page	yes
Science Bowl	yes, done by Dr. Micheal Fultz, WVSU Chemistry Department
summer institute (health science focus)	no
collaboration map	no
Lab Menu	yes

Exhibit Y: Collaborators Beyond the WVSU Biotechnology Graduate Program

January 16, 2015

name	home institution	dates
Nagamani Balagurusumy	Universidad Autonoma de Coahuila, Mexico	
Eric Blough	Marshall University	March 2006 - March 2011
James Denvir	Marshall University	
Phillipe Georgel	Marshall University	
O.S. Isikhuemhen	NC Ag and Tech State Univ.	Sept 2006 - May 2008
Elizabeth Murray	Marshall University	Jan 2009 - May 2010
Ramona Neal	MATRIC	Sept 2006 - May 2008
Maiyon Park	Marshall University	Aug. 2009 - Aug. 2012
Dave Perera	WVSU	August 2013 - present
Gary Rankin	Marshall University	Jan 2006 - Dec 2008
Teodoro Espinosa-Solares	Chapingo Autonomous University, Mexico	Aug 2009 - present
Sridihar Malkaram	WVSU Douglass	
N. Nurul Islam-Faridi	Texas A&M	
Venu Perla	WVSU Douglass	Aug 2014 - Aug 2015
Kevin Rice	Marshall University	Nov. 2010 - Nov. 2013
Florian Reyda	SUNY Oneonta	Sept. 2014 - Aug. 2017
Yan Tomason	Dnipropetrovsk State Agrarian Univ., Ukraine	
Travis Salisbury	Marshall University	Aug. 2009 - Aug. 2012
Kirsten Jensen	University of Kansas	Aug. 2009 - present
Janine Caira	University of Connecticut	Aug. 2009 - present
Doolarie Singh-Knights	WVU	
John Porter	WVU	
Lewis Jett	WVU	
Mafuz Rahman	WVU	
Rakesh Chandran		
Neil Anderson	University of Minnesota	
Siddhartha Dasgupta	Kentucky State University	
David Francis	The Ohio State University	
David Douches	Michigan State University	
Martha Mutschler	Cornell University	
Latchumi Kanthan Bharathi	Indian Institute of Horticultural Research (IIHR)	Sep 15, 2013-Dec 14, 2013
Ramajayam Devarajan	Indian Institute of Oil Palm Research	
Nripendra Singh	National Research Centre on Pomegranate, India	
K. Eraivan Arutkani Aiyanathan	Tamilnadu Agricultural University	

Agenda Item 8.a.iii. **Action**
June 18, 2015

HEPC Institutional Compact

Based on a review of the Higher Education Policy Commission (HEPC) Institutional Compact, approved by the Board of Governors on October 23, 2014 and submitted to the HEPC prior to the November 1, 2014 deadline, an updated submission has been requested and is included on the following pages. The update was developed by University staff based on feedback received from the HEPC Compact Review Team regarding the Graduation Rates strategy.

Pending review and approval by the Board of Governors, University staff will submit the requested update to the HEPC, which approved the Compact at its May 29, 2015 meeting.

West Virginia State University

Institutional Response Template

April 2015

West Virginia Higher Education Policy Commission

Request 1
West Virginia State University's Graduation Rates strategy does not specifically address the required target populations as defined in the 2013-2018 HEPC Master Plan. The review team requests that the institution revise its Graduation Rates strategy to include at least one activity focused on HEPC target populations.

Please revise the strategy below as requested by the review team.

Graduation Rates Strategy

Describe the general focus of the strategy designed to foster progress on the objective. (250 words max)

Activity 1

a. Who is responsible for the implementation of this activity? (name(s) and title(s)) (100 words max)
Dr. Kumara L. Jayasuriya, Provost and Vice President for Academic Affairs; Kimberly Osborne, Vice President for University Relations and Operations; and Katherine McCarthy, Vice President for Enrollment Management and Student Affairs

b. Describe the activity. (250 words max)
Graduation rates will benefit from the activities provided in Progress Toward Degree. Additionally, the University is working with the HEPC on a comprehensive plan that stresses the significance and importance of 15 to Finish.

c. What target populations, if applicable, does this activity address? (100 words max)
The target population is all students with a special emphasis on new freshmen. This focus allows us to begin working with students even before they start classes to understand the importance of 15 credit hours per semester and staying on track to degree.

d. Provide a timeline for implementation of this activity. (250 words max)
The implementation of this activity began in fall 2014 and will be an ongoing activity of the University.

e. What resources (human, physical, finances, etc.) will be deployed to achieve the desired outcomes? (250 words max)
The allocation of financial resources has yet to be determined. As mentioned previously, this activity will require collaboration across administrative areas of the University and their staff to achieve the desired outcomes.

f. What internal and external entities will collaborate to implement this activity? (250 words max)
As a project of the HEPC, all universities in the state are working with the HEPC to implement a plan in one form or another on their campuses. Additionally, as mentioned previously, this activity will require all administrative areas of the University to work collaboratively to effectively and efficiently implement the plan.

g. What are the intended outcomes and how will BOTH the implementation and the outcomes of the activity be assessed? (250 words max)
The intended outcome will be an increase in awareness of timely and cost effective degree completion as evidenced by the number of students, especially first-time freshmen, enrolling in 15 credit hours per semester, for their first year and beyond.

h. Does the activity foster progress in another compact strategy or plan and how? (250 words max)
This activity fosters advancement in metrics associated with Progress Toward Degree; overall enrollment; and retention, because the initiative highlights the impact that 15 to finish has on degree attainment. This could motivate some students to take more classes that would lead to graduation in a timely fashion.

Activity 2

a. Who is responsible for the implementation of this activity? (name(s) and title(s)) (100 words max)
Dr. Kumara L. Jayasuriya, Provost and Vice President for Academic Affairs; Academic Affairs; faculty advisors, Katherine McCarthy, Vice President for Enrollment Management and Student Affairs (follow-up with students)

b. Describe the activity. (250 words max)
Faculty advisor "check-in" with students at 60 credit hours and 90 credit hours to confirm students I and remains on track to degree. Using *MyDegree@State*, the advisor and student will map out courses for the next 1-2 years.

c. What target populations, if applicable, does this activity address? (100 words max)
This activity will be conducted with all students; however we will follow-up with students in all targeted populations to ensure they have met with their advisor and understand the plan they have created with advisor assistance. We monitor voluntary versus "required" participation rates in targeted populations.

d. Provide a timeline for implementation of this activity. (250 words max)
Activity will commence in fall 2015; ongoing.

e. What resources (human, physical, finances, etc.) will be deployed to achieve the desired outcomes? (250 words max)
Provost will message faculty advisors regarding the activity. Provost and VP for Enrollment Management and Student Affairs will create tracking mechanisms.

f. What internal and external entities will collaborate to implement this activity? (250 words max)
Academic Affairs and Enrollment Management and Student Affairs.

g. What are the intended outcomes and how will BOTH the implementation and the outcomes of the activity be assessed? (250 words max)
Intended outcomes include productive conversations between students and advisor at critical stages of the student's academic career. These conversations will reinforce the importance of staying on track to

degree, that the degree is “in reach” and also the availability of support services should they assist the student in persisting to degree.

h. Does the activity foster progress in another compact strategy or plan and how? (250 words max)
This activity fosters advancement in metrics associated with Progress Toward Degree; overall enrollment; and retention, because the initiative highlights the impact of the importance of degree attainment. This could motivate some students to take more classes that would lead to graduation in a timely fashion.

Agenda Item 8.a.iv. **Information**
June 18, 2015

BOG Budget Report

Information is still being developed and will be provided at the meeting.