

***Evidence of Improvements Implemented for Performance Targets Not Met in 2018-19
for the Plant & Soil Science M.S. Program***

Student Learning Outcome 2: Assessment Measure 1

Course: NRE 529: Biostatistics

Evaluation Tools: Holistic rubric. Students must answer homework questions focusing on three areas: 1. Different biological data and approaches to describe them using graphs and summary statistics; 2. The relationship between statistics and parameters and needs for inference; 3. Probability theory and its impact on research design and statistical inference. Each area is evaluated on a 0-10 points scale.

Performance Target: 80% of assignments will score 8 or above on the three defined questions.

Performance Results: For the area of different biological data and approaches to describe them using graphs and summary statistics, the average score is 9.125, 19 of the 21 students scored 8 or above (89%). For the area of the relationship between statistics and parameters and needs for inference area of the homework assignment, the average score is 7.24, 13 of the 21 students scored 8 or above (63%). For the area of the probability theory and its impact on research design and statistical inference, the average score is 8.50, 16 of the 21 students scored 8 or above (76%).

Performance Targets not Met: The performance targets were not met for the following areas:

- o Relationship between statistics and parameters and needs for inference (63%)
- o Area of the probability theory and its impact on research design and statistical inference (76%)

Evidence of Improvements Implemented: The instructor will revisit the areas on relationship between statistics and parameters and needs for inference and probability theory and its impact on research design and statistical inference as needed to ensure students are grasping the fundamental concepts associated with each area. In addition, pre-assessment of student knowledge as it relates to introductory statistics, natural distribution systems, sampling techniques, data arrangement, tests of significance, and logical inference will be conducted for graduate students prior to enrollment in the course. If needed, students will be recommended to enroll in either MTH 500 or NRE 430 before enrolling in NRE 529: Biostatistics.

Student Learning Outcome 2: Assessment Measure 2

Course: NRE 530: Principles of Experimentation

Evaluation Tools: Holistic rubric. Students must answer homework questions focusing on three areas: 1. Basic principles of hypothesis testing and their relationship with scientific method; 2. The appropriate statistical tests for different research questions, data, and research design; 3. Statistical test assumptions, statistical errors and their impact for making inferences. Each area is evaluated on a 0-10 points scale.

Performance Target: 80% of assignments will score 8 or above on the defined questions.

Performance Results: For the area of Basic principles of hypothesis testing and their relationship with scientific method, the average score is 9.13, 6 of the 7 students assessed scored 8 or above: 83%. For the area of appropriate statistical tests for different research questions, data, and research design, the average score is 5.67, 3 of the 7 students assessed had 8 or above (47%). For the area of Statistical test assumptions, statistical errors and their impact for making inferences, the average score is 8.83, 7 of the 7 students assessed scored 8 or above (100%).

Performance Targets not Met: The performance targets were not met for the following areas:

- The target of 80% was not met for area 2 (47%): appropriate statistical tests for different research questions, data, and research design

Evidence of Improvements Implemented: The instructor will strive to put more emphasis and effort in the area determining appropriate statistical tests for different research questions, data, and research design to ensure students are grasping the concepts associated with the area. In addition, we are confident that pre-assessment of student knowledge will identify student weaknesses and provide a basis to improve graduate students quantitative skills and help in building a more comprehensive knowledge base that can be transferred to NRE 530.

Program Outcome 2: Increase the number of graduating students

Assessment Measures: Graduation rate

Assessment Target: Based on a two year average (17/18 and 18/19) 10% increase in three year graduation rate from prior two year average (15/16 and 16/17).

Assessment Results: The number of students graduating did not increase. 3 students on average graduated 17/18 and 18/19, with 9 on average during 15/16 and 16/17.

Use of Results: Stronger recruitment activities have been undertaken and all faculty encouraged to include graduate student assistantships and research in grant proposals, this will take a few years to impact graduation rates. Increased tracking will be made to assure the 3 year time frame is tracked appropriately.

Evidence of Improvements Implemented: As stated above stronger recruitment activities for graduate students have been undertaken and faculty have been encouraged to include graduate assistantships in research grant proposals. In addition, a stronger emphasis has been placed on graduate student evaluations. These evaluations are completed by the graduate student advisor at the end of each semester. The evaluations are used to evaluate student performance to ensure students are progressing through the graduate program in the expected time frames.

Student Learning Outcome 1	
Students show a proficiency of scientific writing and presentation skills	
Outcome 1: Assessment Measure 1	
Class:	NRE 502 Scientific Writing
Course Mode:	Face-to-Face
Assignment:	Introductory writing assignment in NRE 502 (3 out of the 4 questions)
Evaluation Tool:	Rubric: Assessment evaluates an understanding of the importance and need for publishing, ethical issues, and preliminary considerations associated manuscript preparation. Assessment includes four questions of equal value evaluated on 0-10 points scale.
Performance Target:	At least 85% of all submitted assignments will answer 3 out of the 4 questions correctly (greater than 7/10 on each of the questions).
Results:	100% (3 out of 3) of students obtained 100% on the assignment. Please list the results of the 3 out of the 4 questions assessed. 3 out of 3 (100%) of the submitted writing assignments earned 7 points or higher on question # 2 of the introductory writing assignment. 3 out of 3 (100%) of the submitted writing assignments earned 7 points or higher on question # 3 of the introductory writing assignment. 3 out of 3 (100%) of the submitted writing assignments earned 7 points or higher on question # 4 of the introductory writing assignment.
Use of Results:	Target met. The program plans to keep the same measure for next year's plans just to make sure that the program is able to maintain the same or higher minimum acceptable level.
Outcome 1: Assessment Measure 2	
Class:	NRE 591 Graduate Seminar
Course Mode:	Face-to-Face
Assignment:	Acquire the necessary skills to effectively present independent research as measured through grade in class presentation.
Evaluation Tool:	Grading Rubric: Eleven components will be assessed: knowledge of the subject; presentation style; coverage of topic; ability to engage audience; demeanor, enunciation, volume, and vocabulary; clarity and readability; good amount of material per slide; effectiveness; scientific content; quality and quality of the seminar; response to questions. Each component will be scored using a five point scale: poor, fair, good, very good, excellent.

Performance Target:	90% of the presentations will score good or higher on each components. The course is pass/fail. To pass students will be required to score 7/10 on each of the components. 90% of the presentations
Results:	
Use of Results:	

Student Learning Outcome 2	
Ability to design experiments and develop quantitative analytical skills.	
Outcome 2: Assessment Measure 1	
Class:	NRE 529 Biostatistics
Course Mode:	Face-to-Face
Assignment:	Homework assignment
Evaluation Tool:	Holistic rubric. Students must answer homework questions focusing on three areas: 1. Different biological data and approaches to describe them using graphs and summary statistics; 2. The relationship between statistics and parameters and needs for inference; 3. Probability theory and its impact on research design and statistical inference. Each area is evaluated on a 0-10 points scale.
Performance Target:	80% of assignments will score 8 or above on the three defined questions.
Results:	For the area of different biological data and approaches to describe them using graphs and summary statistics, the average score is 9.125, 19 of the 21 students scored 8 or above (89%). For the area of the relationship between statistics and parameters and needs for inference area of the homework assignment, the average score is 7.24, 13 of the 21 students scored 8 or above (63%). For the area of the probability theory and its impact on research design and statistical inference, the average score is 8.50, 16 of the 21 students scored 8 or above (76%).

Use of Results:	This measure is for the full class (Masters and PhD students), reporting will be made every semester so they can be defended. Revisiting the section on inference and assessing students foundations and building a more comprehensive base if necessary. The target of 80% was not met
Outcome 2: Assessment Measure 2	
Class:	NRE 530 Principles of Experimentation
Course Mode:	Face-to-Face
Assignment:	Assignment
Evaluation Tool:	Holistic rubric. Students must answer homework questions focusing on three areas: 1. Basic principles of hypothesis testing and their relationship with scientific method; 2. The appropriate statistical tests for different research questions, data, and research design; 3. Statistical test assumptions, statistical errors and their impact for making inferences. Each area is evaluated on a 0-10 points scale.
Performance Target:	80% of assignments will score 8 or above on the defined questions.
Results:	
Use of Results:	

Student Learning Outcome 3	
Ability to effectively prepare, propose, and conduct scientific research for development and defense of the thesis, while demonstrating adequate depth of knowledge in the field study in a professional setting.	
Outcome 3: Assessment Measure 1	
Class:	Outside of class
Course Mode:	Face-to-Face
Assignment:	Thesis Proposal
Evaluation Tool:	Thesis Proposal Criteria: (1) Effectively presented the state of the scientific problem, purpose of the study, objectives, and materials and methods for the thesis proposal. (2) Showed adequate depth of
Performance Target:	90% of the thesis proposal defense will score passes on both criteria.
Results:	
Use of Results:	
Outcome 3: Assessment Measure 2	
Class:	Outside of class
Course Mode:	
Assignment:	Thesis Defense
Evaluation Tool:	Thesis Oral Examination Criteria: (1) Effectively presented the objectives, techniques, and findings of the thesis/dissertation? (2) Shown adequate depth of knowledge of the results and implications of the thesis/dissertation? (3) Shown adequate depth of knowledge in the field of study in relationship to the degree to be conferred? (4) Shown adequate awareness of the professional setting to the thesis/dissertation defense?. Each criteria is pass/fail
Performance Target:	90% of Oral thesis examinations score passes on all four criteria
Results:	

Use of Results:	
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Program Outcome 1	
Increase, strengthen, and diversify the research capacity of the PSS MS graduate program	
Assessment Measure:	Number of discipline specific and cross-discipline research grants/proposals submitted
Assessment Target:	The number of discipline specific and cross-discipline research grants/proposals submitted will increase by 2.5% each year.
Assessment Results:	
Use of Results:	
Program Outcome 2	
Increase the number of graduating students	
Assessment Measure:	Graduation rates
Assessment Target:	Based on a two year average (18/19 and 19/20) 10% increase in three year graduation rate from prior two year average (16/17 and 17/18).
Assessment Results:	

Use of Results:	
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