

# Statistics MS

## Consistent Cohort Of Graduate Students Each Year

### Goal Description:

A cohort of ten supported graduate students to admit each year. This allows us to maintain a healthy program with consistent class sizes and class schedules.

**Providing Department:** Statistics MS

### RELATED ITEMS/ELEMENTS -----

#### RELATED ITEM LEVEL 1

### Support Ten New Students Each Year

#### Learning Objective Description:

We will support ten new graduate students each year, as many as twenty in the two years of our program. Support should be such that the full-time students are supported by at least \$10,000 more than the cost of tuition and fees.

#### RELATED ITEM LEVEL 2

### Foster a thriving MS program

#### Indicator Description:

In order to foster a thriving MS program in statistics, we need a total of 20 students, ideally 10 students per cohort. Any less than this, and our classes fail to run regularly. Any more than this, and the research needs of the students in such a large program exceed the faculty support available.

#### Criterion Description:

We will recruit enough students to be able to accept a cohort of 10 qualified incoming MS students each fall semester.

#### Findings Description:

We were not be able to achieve our goals. We have recruited five students in the fall 2022 and one in the spring 2023. Due to low stipend, we do not receive a large number of applicants. If we can offer competitive salary for our graduate assistants, we will be able to select good TA/GA which will improve the teaching quality impacting our undergraduate's future.

For us to thrive, we believe that we have to consider implementing the reviewer's suggestions from our program evaluation. Also, it would be helpful to bring more good quality international students if our Office of International Program adheres more friendly and accommodative policy.

#### RELATED ITEM LEVEL 3

### Foster a thriving MS Program

#### Action Description:

We failed to meet the goal to have a cohort of 10 students for each year. We will request the university/college to provide more TA positions and to increase the stipend. As a requirement by the university, we did a program evaluation by an outside independent reviewer couple of years ago. The reviewer suggested increasing the stipend with supplemental funding for summer along with tuition scholarships to cover in-state tuition. According to the review, unless SHSU makes this a top priority, no matter how well-oiled the recruiting plan and academic program are, there is no hope of getting quality students into the program. While there is a high number of applicants to the

program at this stage, consistent underfunding and not being able to accommodate a higher number of students can result in an inability to produce the quality and quantity that is demanded from industry and academia. This will eventually result in a decline in application numbers and enrollments. A reversal can be difficult and costly. With the increase in freshman and developmental level courses, the department is relying on graduate students as teachers of record.

For our MS program to thrive, we believe that we have to consider implementing the reviewer's suggestions. Also, it would be helpful to bring more good quality international students if our Office of International Program adheres more friendly and accommodative policy.

We will request more funding for TAs to meet university seat capacity needs. Also, we will continue to work with the university administration to find a solution for this. At the same time, our faculty will increase their effort to recruit more qualified students.

**Deliver A Curriculum That Emphasizes Communication Skills**

**Goal Description:**

The curriculum will provide students with opportunities to develop the appropriate speaking, analyzing, and writing skills to function as a professional in the subject area. Our sequence of courses for four semester train the students in these skills. Students gain these experiences through different class projects which includes the oral presentation and written report. Students gain these experiences as a part of the Practicum requirement as well.

**Providing Department:** Statistics MS

RELATED ITEMS/ELEMENTS -----

RELATED ITEM LEVEL 1

**Communicating Mathematical Ideas - Oral**

**Learning Objective Description:**

Students will be able to prepare and deliver oral presentations of mathematical material through statistics practicum. Students will develop the ability to critique real world problems, and provide their own solutions based on statistical analysis.

RELATED ITEM LEVEL 2

**Statistics Practicum**

**Indicator Description:**

A statistics practicum(Registered under STAT 6380) should be completed by the students under the guidance of one of the faculty members (practicum supervisor). Students are required to prepare the final report in the form of manuscript that includes abstract, introduction, methodology, results, and conclusion. A letter grade is assigned for the practicum by the supervising faculty based on performance throughout the research project.

**Criterion Description:**

All candidates will receive a letter grade by his/her supervising faculty.

**Findings Description:**

All the students who have registered in the practicum course were able to successfully finish the practicum. Students were not able to present their work at any regional conferences. They presented their work in the weekly professional development seminar.

RELATED ITEM LEVEL 3

Statistics Practicum

Action Description:

Each student work with the faculty in a research project to produce good quality practicums and provide them the opportunity to present their research at regional or national conferences.

Deliver A Curriculum With Appropriate Discipline Specific Skill Sets

Goal Description:

The curriculum will provide students with opportunities to develop professional skills typically required in the area of study. Our course sequence and practicum provide students data analysis, presentation, and report writing skills using different statistical softwares.

Providing Department: Statistics MS

RELATED ITEMS/ELEMENTS -----

RELATED ITEM LEVEL 1

Foundation Areas In Probability And Statistics

Learning Objective Description:

Students will have a working knowledge of the foundational topics including regression analysis, design of experiments, multivariate analysis, and mathematical statistics (Bayesian analysis, bio-statistics, quality control, non-parametric statistics, sampling theory, Time Series Analysis, and statistical computing,).

RELATED ITEM LEVEL 2

Comprehensive Oral Examination

Indicator Description:

A comprehensive oral examination, given by a committee of three or more faculty members, will be administered to candidates for the degree of M.S. in Statistics which will examine the candidate's knowledge of the primary areas of concentration within the program, as well as the candidates own communication abilities. The committee will then judge the candidates' knowledge on the materials according to a previously agreed upon rubric with three levels of comparison: High Pass, Pass, and Fail.

Criterion Description:

All candidates will receive a mark of either "High Pass" or "Pass" for the components of the comprehensive oral exam. The rubric used is the same one shown in the "Mathematical Statistics" criterion.

Findings Description:

Total of six graduate students appeared for the comprehensive oral exam on spring 2023 semester. All students passed the comprehensive oral exam with two students receiving higher pass in two subjects.

RELATED ITEM LEVEL 3

Comprehensive Oral Examination

Action Description:

Five students took the oral comprehensive exam in third week of April 2023 and one student took in on the first week of May. All of them (Six) successfully finished the exam and graduated in May 2023. Students were ranked using high pass, pass, and fail. All of them got either high pass or pass.

# Improve Instruction By TAs

## Goal Description:

We will improve our instructional support for TA instruction in our elementary level Statistics courses. The designated faculty (course-coordinator) trains them for teaching before the semester starts. We will also encourage our assistants to attend the training conducted by GUIA (The Graduate/Undergraduate Instructor Academy).

**Providing Department:** Statistics MS

## RELATED ITEMS/ELEMENTS -----

### RELATED ITEM LEVEL 1

#### Encourage And Train Teaching Assistants For Teaching

##### Learning Objective Description:

Will encourage and assign teaching assistants in elementary statistics courses as instructors. The designated faculty (course-coordinator) will train them for teaching. We will also encourage our assistants to attend the training conducted by GUIA (The Graduate/Undergraduate Instructor Academy).

### RELATED ITEM LEVEL 2

#### Evaluation TA

##### Indicator Description:

Teaching evaluations and classroom visits by faculty. These visits will be managed/scheduled by the graduate advisor and/or course coordinators.

##### Criterion Description:

As many of our teaching assistants are not native speakers, a language barrier may be an additional challenge in their classroom.

##### Findings Description:

A faculty mentor was assigned to all TA serving as instructor of record. The faculty trained them to teach the classes. All the teaching assistants performed their job very well. We found that TA's value the assistance provided by the faculty mentor.

### RELATED ITEM LEVEL 3

#### Evaluation TA

##### Action Description:

A faculty mentor was assigned to all TA serving as instructor of record. The faculty trained them to teach the classes. All the teaching assistants performed their job very well. We found that TA's value the assistance provided by the faculty mentor.

## Update to Previous Cycle's Plan for Continuous Improvement Item

### Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

#### Closing Summary

We will make an effort to increase our funded student cohort size to 10 which will make our total number of funded positions for the program to be 20 students. We can serve our undergraduate students better if we have 20 funded students in our program. We have around 22 sections of STAT/MATH 3379 and 20 sections of MATH 1342 each semester. We use our second-year teaching assistants to teach MATH 1342 and graduate

assistants to help with SPSS (statistical programing) and tutoring. Having more graduate assistants will make a significant impact on the success of our undergraduate students.

A good number of excellent graduate students used to apply to our Statistics program, but many eventually declined after getting higher TA financial offers from more competitive Universities. Recently, we are struggling to recruit good TA's in our program. This type of erosion obviously becomes a pronounced problem for any program. We have identified this as a serious issue for our program. We will continue to request the university to provide additional funding to overcome this problem. The current funding we provide them is not sufficient to pay the tuition fee and other expenses. This is encouraging them to join or transfer to other universities.

We will provide students with more professional development opportunities. Will continuously organize student weekly group sessions where the students can make presentations in a friendly environment. This is a great opportunity for them to learn how to present their research projects. We observed that our students benefited from it significantly so will continue to do this in the coming academic year as well.

We will continue to assign our second-year students to teach introductory statistics courses as instructors of record. We will continue to encourage our students to go through the PACE program graduate teaching perforation training certification. We also encourage our students to go through other professional development programs (Many are available online now).

#### **Update of Progress to the Previous Cycle's PCI:**

We were not able to achieve our goals as we planned. Our plan to produce more researchers, leaders, teachers, and experts in the field of statistics to fulfill the current demand did not meet as we expected. Not only this, we need more assistants to help our undergraduate classes which will be our source for the graduate recruitments. But with limited funding, we could not hire as many assistants as we thought. Also, the stipend we give them is not enough to cover their basic expenses including tuition fees. This is restricting us to recruit the good students for our program.

We will continue with the same plan for the upcoming year. We believe this would be a good opportunity to raise the issues mentioned above to help improving our program. Low stipend is the main issue we we would like to bring in attention to the University.

We will continue to provide professional development opportunities and prepare our students to be fulfill the current demand in solving the real world problems. We can assign all of our second year student to teach our introductory statistics classes if we become competitive in hiring and able to offer Assistantship to more qualified applicants. Assigning them in teaching will help the University/Department financially as well.

### **New Plan for Continuous Improvement**

#### **Closing Summary:**

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We will make an effort to increase our funded student cohort size to 10 which will make our total number of funded positions for the program to be 20 students. We can serve our undergraduate students better if we have 20 funded students in our program. We have around 23 sections of STAT/MATH 3379 and 19 sections of MATH 1342 each semester. We use our second-year teaching assistants to teach MATH 1342 and NO classes. Our graduate assistants help STATS 3379 students with SPSS (statistical programing) homework/projects in lab and tutoring. Having more graduate assistants will make a significant impact on the success of our undergraduate students.

A good number of excellent graduate students initially apply to our Statistics program, but many eventually decline after getting higher TA financial offers from more competitive Universities. Over time, this type of erosion obviously becomes a pronounced problem for any program. We have identified this as a serious issue

for our program. We will continue to request the university to provide additional funding to overcome this problem. The current funding we provide them is not sufficient to pay the tuition fee and other expenses. This is encouraging them to join or transfer to other universities.

To provide our students the best skill needed to solve the real world problems, we are working on some changes in the program. As an initiation, we have changed our degree name to MS in Statistics and Data Science. We will work on the the course structures that provides more data analysis training to the students.

We will provide students with more professional development opportunities. Will continuously organize student weekly professional development sessions where the students make presentations in different statistical modeling projects. This is a great opportunity for them to learn how to present their research projects. We observed that our students benefited from it significantly so will continue to do this in the coming academic year as well.

We will continue to assign our second-year students to teach introductory statistics courses as instructors of record. We will continue to encourage our students to go through the PACE program graduate teaching perforation training certification. We also encourage our students to go through other professional development programs (Many are available online now).