

### EXECUTIVE SUMMARY

Academic Program Review  
College of Arts and Sciences

### DEPARTMENT/PROGRAM

Mathematic and Statistics

### EXTERNAL REVIEWERS

Ali Arab, Associate Professor, Georgetown University  
Solomon Friedberg, James P. McIntyre Professor, Boston College  
Ami Radumskaya, Professor, Pomona College

### CAMPUS VISIT

May 8<sup>th</sup> – 10<sup>th</sup> 2017

The review team read the *Self Study* written by the faculty in USF's Mathematic and Statistics Department, reviewed the curriculum, course syllabi and evaluations; interviewed faculty, students and staff; and met with the Dean, Associate Deans, Vice Provost of Diversity and Community Engagement, and other relevant members of the campus community. Prior to their visit, the reviewers were provided with USF's Vision, Mission, Values Statement, the program's self-study and other university materials.

**1. How did the external review committee rate the quality of the program – excellent, very good, good, adequate, or poor? How does the program compare with benchmark top-tier programs nationally? Please provide a brief rationale for the external review committee's rating.**

The committee gave the Mathematics and Statistics Department an overall rating between **Adequate and Good**.

"The Department of Mathematics and Statistics at USF has made some astonishing strides in the past few years. It has seen a strong increase in the number of majors and minors, and has introduced a new program in Data Science that has attracted even more majors. The faculty are dedicated to teaching and active in research and in the broader mathematics community. We have identified some areas of concern, many of them due to the rapid growth of the department and to the needs of the new MSAN program."

**2. What are the most important general issues that emerged from the external review process?**

The committee provided reported the following **strengths**:

#### Faculty

- "The department is described as peopled by highly committed faculty who are passionate about what they do, faculty who handle a wide range of university responsibilities in an exemplary way."
- "The department has broad service responsibilities on campus" and "At a time of record growth in STEM areas, many of which require expertise in mathematics, this success with students in other quantitative majors is a significant contribution to the campus."
- "The mathematics and statistics faculty are fully engaged, enthusiastic and dedicated teachers."

#### Students

- "Enrollment in the mathematics major is robust and represents a substantial increase (23%) since the prior review"
- *Success with diverse students*; "Though the number of African-American mathematics or BS/DS majors is quite small, the number of Latino and Asian majors is impressive."

- “The department has successfully launched an undergraduate program in data science (BSDS), (which is) among the earliest undergraduate programs in data science in the nation and it is also a unique program in the Bay Area.”

The committee provided reported the following **weaknesses**:

#### Faculty

- *Department energies and collegiality* – “... several faculty are heavily involved in (and captivated by) the new BSDS and MSAN programs, while others are focused on the service and math major teaching.”  
Departmental leadership and some senior faculty members see the new BSDS and MSAN programs as the main departmental priority while, other parts of the department have received less support; “we fear that some faculty view their contributions as of lesser importance....”
- *Faculty are spread thin* – “...this dedicated group of faculty are stretched thin, and the amount of commitment might not be sustainable.”
- *Adjunct Faculty* do a mixed job in their teaching... “there is also low morale among some of the adjuncts and some of them do not feel valued by the department.”
- *Institutional Constraints in the Role of Departmental Management*: The role and responsibilities of the department Chair are unusually limited, which we understand is due to the unionized structure of the faculty at USF and the contract that has resulted

#### Curriculum

- *Lack of attention to promoting mathematical and statistical thinking* – “The current departmental focus and resource priorities seem to be the recent programs in data science (BSDS and MSAN)”; the department has not been focusing on its core mission of promoting mathematical and statistical thinking and quantitative reasoning.”
- *The Major Curriculum* – “The requirements for the math major are, in our opinion, light. “

#### Students

- *Advising* – “... is the domain of a small number of (well-intentioned) individuals who have many other responsibilities.” and “...there is a great deal of frustration among numerous students concerning the transition from the university to the working world, and a strong sense that departmental advice about this transition is not available.”
- *Connection to careers* – “The undergraduates in both Data Science and in Mathematics indicated that they would greatly value more information about possible careers and more assistance with a job search.
- *Lack of student community* – “Students reported a sense of disconnectedness from the department and from the broader mathematics community; they also noted a lack of communal study space, and a lack of study sessions for upper division courses.”
- *Opportunities for undergraduate research* – “While the *Self Study* lists undergraduate research projects which look quite interesting, it is not a long list of students, and the students are supervised by only a few of the faculty.”

#### Facilities

- *Inadequate space* - the department is in need of more space – “faculty offices are small and windowless, adjuncts must share offices or use the library, and some faculty who split their time between the downtown campus and the main campus have no office on Hillside at all. More importantly, the department has no communal space beyond the department office, which houses the department administrative assistant and mailboxes.”

#### Operations & Resources

- *Budget-related Issues* – “The department budget is limited ... inadequate allocation for the BSDS program, which limits the activities and support for the relatively large number of BSDS majors... limited available resources for community building and professional development activities in the department.”
- *Administrative Assistant Support* – “At present, the current administrative assistant for the department is spread very thin in keeping up with the increased demand for support, and we heard reports of ways that this was affecting faculty and students that should be addressed.”
- *The Education of Future Teachers* - The department is seeking approval for a Middle School Mathematics Content minor. However, the minor as presently conceived does not systematically develop the

mathematics pedagogical content knowledge which would be required in such teaching, and in fact departmental faculty know little about this topic.”

- *Student Learning Center* - The student Learning Center and the Mathematics and Statistics Department do not seem to be communicating effectively”

### **3. What specific recommendations for improving the program’s quality has the external review committee made to the Dean?**

The committee provided the following recommendations:

#### Faculty

- Hire a full time term faculty member with a specialty in statistics education, to teach, oversee and manage the lower division statistics courses.
- Convert Emille Lawrence to a tenure track or tenured position.
- Hire one new tenure track faculty member in statistics, and one new tenure track hire in mathematics (pure or applied).
- Engage with adjuncts
- Value departmental interactions

#### Curriculum

- Place a greater emphasis on the value of mathematical and statistical thinking.
- Strengthen the mathematics major.
- Consider developing mathematical modeling as a service learning course.

#### Students & Student Support

- Rethink approach to advising and distribute it among all fulltime faculty members
- Connect to the Career Center and publicize career paths.
- Build community
- Encourage undergraduate research

#### Facilities

- Address the space shortage: remove the bookcases in the interior corridors, then improve the quality of the lights, repaint the spaces, and equip the corridors with glass boards across from secured benches or chairs.

#### Operations and Resources

- Increase “communication about the budget ... between the BSDS Director, the Department Chair, and the Dean”
- Secure additional departmental administrative support
- Explore increasing the department's presence in mathematics education
- Strengthen connections with the Learning Center
- Develop a prioritized list of IT needs for data science faculty
- Improve the flow of information to other campus units and to students

### **4. In the opinion of the external review committee, is the program following the University’s strategic initiatives?**

### **5. In what way is the program contributing to the goal of making the University of San Francisco a premier Jesuit, Catholic urban university with a global perspective that educates leaders who will fashion a more humane and just world?**

**6. What is the timetable for the response to the external review committee's recommendations for program improvement? What can the Office of the Provost do to appropriately respond to the review?**

The next step is for the Dean and Associate Deans to meet with the Chair and full time faculty members of the Mathematics and Statistics Department and discuss the action plan based on the *Self Study* and the *External Reviewers' Report*. Based on the agreed upon *Action Plan*, the Office of the Provost can assist the program by allocating necessary resources to implement those actions.

**7. What general comments or issues, if any, are crucial to understanding the reviewers report?**