



# University of Toronto Quality Assurance Process (UTQAP) Cyclical Review: Final Assessment Report and Implementation Plan

<b>Programs Reviewed:</b>	<p>Statistics, B.Sc. (Hons.): Specialist, Major, Minor</p> <p>Applied Statistics, B.Sc. (Hons.): Specialist</p> <p>Actuarial Science, B.Sc. (Hons.): Specialist, Major</p> <p>Statistical Sciences, M.Sc., Ph.D.</p>
<b>Unit Reviewed:</b>	Department of Statistical Sciences
<b>Commissioning Officer:</b>	Dean, Faculty of Arts & Science
<b>Reviewers (Name, Affiliation):</b>	<ol style="list-style-type: none"> <li>1. Professor Mary Thompson, Statistics and Actuarial Science, University of Waterloo</li> <li>2. Professor Richard Davis, Chair, Department of Statistics, Columbia University</li> <li>3. Professor Simon Sheather, Department of Statistics, Texas A&amp;M University</li> </ol>
<b>Date of review visit:</b>	January 26 – 27, 2017
<b>Date reported to AP&amp;P:</b>	November 2, 2017

Unless otherwise noted, all bulleted comments apply to all programs reviewed.

## 1 Outcome

- The Committee on Academic Policy and Programs (AP&P) concluded that the Decanal response adequately addressed the review recommendations.

## 2 Significant Program Strengths

- High national and international profile in research
- Strong and effective leadership and good faculty morale
- Forward-looking thinking that “foresaw the Big Data/Data Science revolution”
- A modernized undergraduate curriculum (for example, the new Data Science program)
- Innovative courses, delivery techniques and approaches
- Strong relationships in cross-disciplinary teaching and with UTM and UTSC.

## 3 Opportunities for Program Enhancement

The reviewers recommended that the following be considered:

- Monitoring enrolment growth: working with the Faculty of Arts and Science to develop a plan that limits undergraduate program enrolment, establishes minimum grade requirements in pre-requisite courses, and ensures appropriate levels of staffing and teaching assistant training, to support a high quality educational experience and adequate student preparation
- Developing the new undergraduate specialist program in Data Science
- Ensuring the continued availability of subjects in the core of the discipline
- Reimagining the doctoral stream master’s program, given the mix of doctoral and professional aspirations of students
- Maintaining efforts to increase PhD enrolment, including international student enrolments, to maintain the Department’s excellence, while attempting to even out supervisory responsibilities
- Adding staff to support IT infrastructure
- Developing a space plan to further enhance department cohesion and address growth



David Cameron, FRSC  
*Dean*

October 12, 2017

Professor Sioban Nelson  
Vice-Provost Academic Programs  
University of Toronto

## **Re: Review of Department of Statistical Sciences**

Dear Sioban,

Along with the faculty, staff and students of the Department of Statistical Sciences, I am pleased with the external reviewers' assessment of the Department of Statistical Sciences and its undergraduate programs: Statistics, B.Sc., Hons. (Specialist, Major, Minor); Applied Statistics, B.Sc., Hons (Specialist); Actuarial Science, B.Sc., Hons. (Specialist, Major); and graduate degrees: Masters of Financial Insurance (MFI); Statistics, M.Sc. and Statistics, Ph.D. The reviewers complimented the Department of Statistical Sciences on "leading the way in terms of modernization of content" in undergraduate and graduate courses and programs, and noted that "the current Department head is viewed as a very effective leader, by both the faculty and the staff of the Department."

The quality of this program notwithstanding, as per your letter dated September 21, 2017, the review report raises a number of issues and challenges. I am writing to address the areas of the review report that you identify as key. The response to these items is separated into immediate- (current-3 months)/medium- (3-12 months)/longer- (12+months) term action items for the Department of Statistical Sciences, where appropriate. The Department of Statistical Sciences has discussed the reviewers' comments through consultation with various groups and has begun to implement changes where appropriate and that are consistent with the Department of Statistical Sciences' mission.

### **1. Curriculum and Program delivery**

#### **A) Undergraduate programs**

*The reviewers were concerned about the recent rate of enrolment growth and recommended that the Department work with the Faculty of Arts and Science to develop a plan that limits undergraduate program enrolment, establishes minimum grade requirements in pre-requisite courses, and ensures appropriate levels of staffing and teaching assistant training, to support a high quality educational experience and adequate student preparation.*

The Faculty recognizes that Statistical Sciences has experienced extraordinary growth over the past five years. At its most recent meeting in March, 2017, the Committee on Admissions considered and ultimately did not adopt a proposal from Statistical Sciences to introduce admission criteria that would limit enrolment in the POST; limiting enrolments in this high-demand program would have the knock-on effect of shifting enrolment pressure to Mathematics (which currently does not have enrolment controls), and other related programs. The Faculty is currently examining options for controlling enrolments in a more holistic and considered way; the program by program approach simply shifts the enrolment challenge from one department to another, which is frustrating for faculty, students, and administrators.

#### Immediate to Medium-term:

Responding to challenges faced by the program, the Faculty has significantly increased the faculty complement in this department. In the 3 years from 2015/16 to 2017/18 and following the recommendations of the Faculty Appointments Committee (FAC), the Dean allocated to Statistical Sciences 7 new faculty lines consisting of 3 teaching stream and 4 research stream faculty. In addition, the FAC recommended and the Dean allocated back to the department all vacant positions from resignations or other departures.

To deal with the enrolment pressures in the immediate term, moreover, the Faculty has allocated a CLTA, effective January 2018, to allow for additional sections of key courses.

To ensure that the student experience is not compromised by growth in this area, the Faculty has approved two new staff positions for the Department to support undergraduate programs. In addition, the Faculty has expanded the space footprint of the Department's Learning Centre to support undergraduate students. The Faculty has also approved substantial growth in ELL (English Language Learning) & WIT (Writing Instruction for TAs) funds for the training of TAs. Finally, the Faculty has approved funding for significant growth in a peer-to-peer mentorship program to improve the UG student experience.

#### Medium to Longer-term

Consideration of future new faculty positions typically takes place through the formal faculty appointments process: units submit requests in the spring of each year, and these requests are considered by the Faculty Appointments Committee (FAC), which includes faculty representatives from across the three FAS sectors (the Humanities, Social Sciences, and Sciences) as well as the Colleges. After considering the full range of requests, the FAC makes recommendations to the Dean. Any request for additional faculty positions has an impact across the division, and as such, faculty appointments are considered not in isolation, but with respect to needs that exist across the Faculty, including changing

enrolment pressures. Requests from the Department for additional faculty appointments will be considered at the next FAC meeting in the spring of 2018.

*The reviewers endorsed the development of the new undergraduate specialist program in Data Science.*

Immediate-term:

The proposed Data Science program is a new specialist that will be offered jointly by Computer Science and Statistical Sciences. The external review for this new program took place September 22, 2017. The program proposal is moving through governance.

*While the reviewers commended the Department's modernization of the curriculum, they highlighted the importance of ensuring the continued availability of subjects in the core of the discipline.*

Immediate to Longer-term:

The Department has an international reputation for research and education at the core/foundation of the discipline and many of its faculty would strongly agree with the reviewers' comment. These faculty will ensure the core of the discipline will not be abandoned as the Department rightly modernizes its curriculum. As the Department modernizes its curriculum it seeks to integrate the subjects in the core of the discipline as they are critical to the appropriate use of statistical methods/computation

**B) Graduate programs**

*The reviewers encouraged the department to reimagine its doctoral stream master's program, given the mix of doctoral and professional aspirations of its students.*

Medium-term:

Curriculum renewal will take place within the current MSc. The current MSc will truly become a doctoral stream Masters program only. Prospective students with professional aspirations may be directed to the Data Science concentration within the MScAC. The current cohort of 20 (approximately) MSc students will be reduced over time to those truly interested in doctoral studies (5 or less). Planning for this is being discussed by the FAS Vice Dean, Graduate, and the Department.

*The reviewers supported efforts to increase PhD enrolment, including international students enrolment, which would help the Department maintain its excellence; they also suggested attempting to even out supervisory responsibilities.*

Medium to Longer-term:

With the recent and ongoing increases in faculty complement, PhD student growth will follow. Shifting resources (UTF funds) from the MSc program to the PhD program should also facilitate growth. The hiring of new faculty in the areas of Actuarial Science & Mathematical Finance (a sought-after PhD field in the Department) will help to even out supervisory responsibilities as will faculty complement growth in general.

**2. Resources to Support Programs**

*The reviewers suggested the Department consider adding staff to support IT infrastructure.*

Immediate-term:

Recognizing the need for additional staff, the Faculty has recently approved 4 new staff positions. These include two staff to support the undergraduate program, mentioned above, one staff member to support the MFI program, and one EA. The Department's IT staff are working with the Faculty's Instructional and Information Technology (IIT) office to explore the IT needs of Statistical Sciences and how to address them. In addition, there are discussions for a possible allocation of two more administrative staff, one for communication and one more to support the undergraduate program.

*The reviewers recommended the development of a space plan to further enhance department cohesion and address growth.*

Immediate to Medium-term:

New space has been allocated to the Department commencing the summer of 2016. More space was allocated and renovated over the summer of 2017 and the Department now occupies the entire 4<sup>th</sup> floor of the Stewart Building, complete with new and additional offices for faculty and staff. This space also included new and expanded graduate student space and a new classroom. The Faculty has significantly expanded the space footprint for the Department's learning center.

Medium to Longer-term:

The Faculty recognizes that the Department has experienced significant growth and will continue to work closely with the Department to address ongoing space needs.

To conclude, we appreciate that the external reviewers identified the Department of Statistical Sciences' strengths and noted a few areas for development. The Department of Statistical Sciences has already begun to move forward with plans to address the recommendations as presented by the reviewers.

Sincerely,



David Cameron,  
Dean and Professor of Political Science

cc. Jamie Stafford, Chair, Department of Statistical Sciences  
Poppy Lockwood, Vice-Dean, Academic Planning and Strategic Initiatives

## 5 Executive Summary

The reviewers identified the programs' strengths as its high national and international profile in research; strong and effective leadership and good faculty morale; forward-looking thinking that "foresaw the Big Data/Data Science revolution"; a modernized undergraduate curriculum; innovative courses, delivery techniques and approaches; and strong relationships in cross-disciplinary teaching, and with UTM and UTSC. The reviewers recommended that the following issues be addressed: monitoring enrolment growth; developing the new undergraduate specialist program in Data Science; ensuring the continued availability of subjects in the core of the discipline; reimagining the doctoral stream master's program; maintaining efforts to increase PhD enrolment, including international student enrolments, to maintain the Department's excellence, while attempting to even out supervisory responsibilities; adding staff to support IT infrastructure; and developing a space plan to further enhance department cohesion and address growth. The Dean's Administrative Response describes the Faculty, unit and programs' responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result. The Committee on Academic Policy and Programs (AP&P) concluded that the Decanal response adequately addressed the review recommendations.