

UTQAP Cyclical Review: Final Assessment Report and Implementation Plan

1 Review Summary

Program(s) Reviewed:	<p>Mathematics (HBSc): Specialist, Major, Minor Applied Mathematics (HBSc): Specialist Mathematics and Physics (HBSc): Specialist Mathematics and Philosophy (HBSc): Specialist Mathematical Applications in Economics and Finance (HBSc): Specialist Mathematics and its Applications (Physical Science) (HBSc): Specialist Mathematics and its Applications (Probability/Statistics) (HBSc): Specialist Mathematics and its Applications (Teaching) (HBSc): Specialist</p> <p>BSc: Mathematics, Major / MT: Master of Teaching Combined Degree Program</p> <p>Mathematics: MSc, PhD</p>
Unit Reviewed:	Department of Mathematics
Commissioning Officer:	Dean, Faculty of Arts & Science
Reviewers (Name, Affiliation):	<ul style="list-style-type: none"> • Professor Jacques Claude Hurtubise, Department of Mathematics and Statistics, McGill University • Professor Rachel Kuske, School of Mathematics, Georgia Institute of Technology • Professor Martin Olsson, Department of Mathematics, University of California, Berkeley
Date of Review Visit:	April 12 & April 14, 2022 (conducted remotely)
Review Report Received by VPAP:	June 23, 2022
Administrative Response(s) Received by VPAP:	September 22, 2023
Date Reported to AP&P:	October 24, 2023

Previous UTQAP Review

Date: March 25, 2013

Summary of Findings and Recommendations

Significant Program Strengths

- One of the best mathematics departments in North America
- High quality, successful programs
- Faculty's excellent publication record
- Department's broad research expertise within a range of sub-disciplines

Opportunities for Program Enhancement

- Preparing graduate students for non-academic employment
- Increasing the number of graduate courses in key fields
- Addressing time to completion by relaxing first-year doctoral course requirements
- Ensuring adequate funding for international graduate students to aid in recruitment
- Identifying the appropriate balance between teaching and tenure stream faculty and exploring the use of innovative methods of instructional delivery
- Addressing low faculty morale
- Enhancing faculty and graduate student office space and undergraduate student study space

Current Review: Documentation and Consultation

Documentation Provided to Reviewers

Terms of reference; Self-study & Appendices; Previous review report including the administrative response(s); Access to all course descriptions; Access to the curricula vitae of faculty.

Consultation Process

Dean, and Acting Vice-Dean, Academic Planning, Faculty of Arts & Science; Department Chair; Associate Chair Undergraduate and Associate Chair Graduate; tenure-stream faculty; teaching-stream faculty; tri-campus graduate faculty; undergraduate and graduate students; administrative staff; senior program administrators; chairs of cognate units: Department of Computer Science, Department of Statistical Sciences, Department of Economics, Department of Philosophy, Department of Physics, Faculty of Arts & Science; and Department of Chemical Engineering, Department of Electrical & Computer Engineering, Faculty of Applied Science & Engineering.

Current Review: Findings and Recommendations

1. Undergraduate Program(s)

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

The reviewers observed the following **strengths**:

- Overall quality
 - ▶ Department is one of the country's leading venues for an advanced undergraduate degree
 - ▶ Specialist program is very rigorous
- Objectives
 - ▶ Values of the program are embodied in reasonable course offerings
- Admissions requirements
 - ▶ Department provides opportunities for all students wishing to study mathematics
 - ▶ Extraordinary growth in all programs over the last decade
- Curriculum and program delivery
 - ▶ Good variety of courses offered
- Innovation
 - ▶ Several valid pedagogical innovations, mostly on the part of the teaching-stream faculty; overall sense is that of a fairly traditional delivery
- Student engagement, experience and program support services
 - ▶ Specialist students report high satisfaction with their programs
- Quality indicators – undergraduate students
 - ▶ High participation rate in the department's Putnam competition a very strong point

The reviewers identified the following **areas of concern**:

- Overall quality
 - ▶ The Major program seen by some as receiving less attention from tenure-stream faculty than Specialist programs
 - ▶ Major program experiencing growing pains associated with “massive influx” of students in recent years, attributed in part to limited enrolments in computer science and statistics programs
- Objectives
 - ▶ Program learning outcomes do not mention providing overview-level knowledge of the subject; some learning outcomes lack appropriate depth for a university-level program
- Admissions requirements
 - ▶ Students are forced to choose between Specialist or Major program streams “too early” and in a way that may seem irrevocable; Specialist programs may therefore miss very strong students due to limited opportunity to enter these programs for students who pursue mathematics after first considering other fields

- Curriculum and program delivery
 - ▶ Students expressed a desire for better integration of the curriculum with related fields of study relevant to their post-graduation plans
 - ▶ High enrolments leading to concern regarding course coverage, particularly the conflicting aims of reducing class sizes (by offering additional sections of some larger courses) and continuing to offer a diverse range of courses
 - ▶ Reviewers heard concern that Major program is neglected by tenure stream faculty, with “overloaded” teaching stream faculty providing most of the teaching in the program
- Accessibility and diversity
 - ▶ Lack of explicit support for “underrepresented” groups noted as a source of stress, related to barriers to accessing different programs
- Student engagement, experience and program support services
 - ▶ Advising for students in mathematics programs is an issue; central advising resources seen as unhelpful, while departmental resources are “under severe stress”
- Quality indicators – undergraduate students
 - ▶ Student:faculty ratio in the department is “nearly three times” that of the Faculty of Arts & Science overall
 - ▶ Number of NSERC summer undergraduate research awards taken up by students in the department is relatively low compared other Canadian universities

The reviewers made the following **recommendations**:

- Overall quality
 - ▶ Ensure appropriate attention and participation of tenure stream faculty across all programs
- Curriculum and program delivery
 - ▶ Consider how courses offered by other departments might be integrated into programs to support students’ post-graduation plans
 - ▶ Consider revising program learning outcomes
 - ▶ Undertake a curriculum review to help balance program offerings in light of significant recent changes in student populations
- Quality indicators – undergraduate students
 - ▶ Provide additional support for coordination of summer research, particularly for applications to NSERC summer scholarship programs

2. Graduate Program(s)

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

The reviewers observed the following **strengths**:

- Overall quality
 - ▶ Graduate programs appear to be sound and running well
- Curriculum and program delivery
 - ▶ Good array of course offerings and active research seminars in the department
- Student engagement, experience and program support services
 - ▶ Students expressed that they are happy with their programs and supervisors
- Quality indicators – graduate students
 - ▶ Time-to-completion rates are in line with the Faculty of Arts & Science overall
 - ▶ Enrolment numbers across graduate programs are consonant with other major Canadian universities
- Student funding
 - ▶ Funding levels and TA loads are similar to other Canadian universities

The reviewers identified the following **areas of concern**:

- Accessibility and diversity
 - ▶ Some issues were expressed regarding the diversity of the student body
- Student engagement, experience and program support services
 - ▶ Informal administrative structure in the department results in gaps in mentorship for graduate students
 - ▶ Many graduate students conduct their research outside of the department due to limited graduate student space availability
- Student funding
 - ▶ Graduate student funding levels, while similar to those elsewhere in Canada, noted as low by international standards

The reviewers made the following **recommendations**:

- Student engagement, experience and program support services
 - ▶ Ensure appropriate mentorship for graduate students, including incoming students
 - ▶ Review the TA workload for uniformity, particularly for students in the first year of their program
 - ▶ “While graduate students noted the excellent support of department staff members, more points of access and capacity for support of graduate students would be helpful”
 - ▶ Increased availability of student space would benefit graduate student research

3. Faculty/Research

The reviewers observed the following **strengths**:

- Research
 - ▶ “By any metric the research achievements are excellent”
 - ▶ Departmental research covers all major areas of pure math, with recent growth in applied mathematics.
- Faculty
 - ▶ Faculty are internationally recognized with a number of prestigious awards
 - ▶ Reviewers note that “research faculty” are also heavily engaged in teaching, through traditional teaching as well as mentoring graduate students and postdoctoral fellows
 - ▶ Contributions of the teaching stream faculty are “manifold”
 - ▶ “Department has a strong cadre of young teaching faculty, who are doing their jobs well”
 - ▶ Extremely impressive recent hires; department “has been very successful in identifying outstanding candidates with a particular attraction to Toronto”

The reviewers identified the following **areas of concern**:

- Faculty
 - ▶ Workloads for teaching stream faculty appear heavy
 - ▶ Reviewers note issues with morale among teaching stream faculty related to feeling isolated from the research faculty, and excluded from opportunities that would allow a more fruitful career in the long term
 - ▶ Gaps in availability of mentorship, including for newer faculty
 - ▶ Department is somewhat competitively disadvantaged in terms of the teaching load and the financial compensation it can offer to prospective faculty hires

The reviewers made the following **recommendations**:

- Faculty
 - ▶ Develop a faculty complement plan for growth in relation to recent increases in student enrolments and current curricular needs; this plan should consider a realistic rate of hiring, opportunities for disciplinary growth, the balance between tenure stream and teaching stream faculty, and tri-campus relationships
 - ▶ Recognize the valuable contributions of teaching stream faculty and consider strategies for balancing their duties within the department; consider opportunities to integrate teaching stream faculty into leadership roles in the department’s teaching mission
 - ▶ Provide opportunities for teaching stream faculty to teach more specialized courses
 - ▶ Review the mentorship structure for faculty members and post-doctoral fellows
 - ▶ Maintain flexibility in faculty hiring and consider incorporating some “priority areas” into the hiring process

4. Administration

Note: Issues that are addressed through specific University processes and therefore considered out of scope for UTQAP reviews (e.g., individual Human Resources issues, specific health and safety concerns) are routed to proper University offices to be addressed, and are therefore not included in the Review Summary component of the Final Assessment Report and Implementation Plan.

The reviewers observed the following **strengths**:

- Relationships
 - ▶ Faculty, staff, and students all displayed great commitment to the mission of the department and university
 - ▶ Reviewers were impressed with the work of the staff and their dedication to the department
 - ▶ Staff have strong relationships with each other and other members of the department
 - ▶ Relationship with nearby Fields Institute noted as an asset for the department
 - ▶ St. George campus office space for UTM and UTSC faculty noted as a key component of healthy tri-campus interactions
- Long-range planning and overall assessment
 - ▶ Outstanding department conducting world-class research and serving a huge number of students in its teaching mission
 - ▶ Department has seen an enormous growth in the number of students over the last decade; reviewers commend the department for providing opportunities “for so many students who may otherwise have to forego a major in STEM”
 - ▶ Many members of the department expressed strong engagement on EDI-related matters; reviewers note that there is a lot of positive momentum at the “grassroots” level
- International comparators
 - ▶ Department is “arguably the top mathematics research department in Canada and is among the strongest math departments in North America”

The reviewers identified the following **areas of concern**:

- Relationships
 - ▶ Some site visit participants raised concerns regarding poor communication from the department, which can lead to department members feeling less valued” or “feeling under-appreciated
 - ▶ Representatives from cognate units expressed a desire for a more formal regular mechanism for coordination on shared initiatives
- Organizational and financial structure
 - ▶ Informal operation and communications within the department seem to give rise to a disconnect between the experiences and perceptions of various groups within the department and those of the senior faculty and department leadership

- ▶ Important information is often received through informal channels rather than through direct communication from department leadership
- ▶ Committee work appears to function without much input from the faculty as a whole; reviewers note the risk of “disconnecting expertise from where it is needed”
- ▶ Staffing concerns related to the lack of a department manager, misclassification of student services staff positions, and significant recent turnover
- ▶ Space concerns are negatively impacting department’s teaching mission, staff work, and faculty research, and contributing to a lack of faculty cohesiveness
- ▶ Space issues obstructing faculty hiring processes are harming the mission of the department and will require assistance from the University to address
- Long-range planning and overall assessment
 - ▶ Recent enrolment increases causing strain on department’s teaching mission and resources for supporting students
 - ▶ Availability of resources and space noted as the main constraints on graduate program size
 - ▶ EDI concerns raised repeatedly in meetings with students and some other members of the department, but received little attention in the self-study and in meetings with department leadership
 - ▶ Funding for hiring faculty and staff appeared to fluctuate, limiting the development of longer-term strategies

The reviewers made the following **recommendations**:

- Relationships
 - ▶ Develop a more structured approach to departmental communications with junior faculty, postdocs, staff, and students
 - ▶ Develop a more formal regular mechanism for coordination and discussion with cognate units
 - ▶ Noting strong connections between the fields of data science and mathematics, as well as strongly overlapping student interests, the reviewers observe that it would be “mutually beneficial to maintain strong and vibrant ties” with data science, especially in the context of the projected School of Computational and Data Science
- Organizational and financial structure
 - ▶ Consider reviving the elected Advisory group mentioned in the department’s constitution
 - ▶ Revise structure of regularly scheduled departmental meetings to potentially include committee reports on topics such as curriculum, hiring, and EDI
 - ▶ Consider exploring further opportunities to integrate the UTM and UTSC campuses into the research environment
 - ▶ Integration of research activity with UTM and UTSC campuses “may also be fruitful in thinking about the space issues”
 - ▶ Consider current job classifications in light of student services staff turnover
- Long-range planning and overall assessment
 - ▶ Begin gathering relevant data to better understand EDI-related issues affecting the department

- ▶ Develop processes to support EDI in critical areas such as hiring of new faculty and recruitment of graduate students
- ▶ Recognize and continue to support department members and groups in their work on EDI issues
- International comparators
 - ▶ Department's current challenges and opportunities are consistent with those of other top math departments; reviewers note that peer institutions may provide good examples on topics including surging enrolments, balance of teaching and research faculty, best practices in EDI, communications, and opportunities presented by emerging connections with data science

2 Administrative Response & Implementation Plan



UNIVERSITY OF TORONTO
FACULTY OF ARTS & SCIENCE

September 21, 2023

Professor Susan McCahan
Vice-Provost, Academic Programs
University of Toronto

RE: UTQAP cyclical review of the Department of Mathematics and its programs

Dear Prof. McCahan,

I write in response to your letter of June 2, 2023, regarding the April 12 & April 14, 2022, UTQAP cyclical review, held remotely, of the Department of Mathematics and its undergraduate and graduate programs: Mathematics, BSc Hons (Specialist, Major, Minor); Applied Mathematics, BSc Hons (Specialist); Mathematics and Physics, BSc Hons (Specialist); Mathematics and Philosophy, BSc Hons (Specialist); Mathematical Applications in Economics and Finance, BSc Hons (Specialist); Mathematics and its Applications - Physical Science, BSc Hons (Specialist); Mathematics and its Applications - Probability/Statistics, BSc Hons (Specialist); Mathematics and its Applications – Teaching, BSc Hons (Specialist); BSc Hons - Mathematics, Major / MT - Master of Teaching (Combined Degree Program); Mathematics, (MSc; PhD), and requesting our Administrative Responses.

On behalf of the Faculty of Arts & Science, we would first like to thank the reviewers, Jacques Claude Hurtubise, McGill University, Rachel Kuske, Georgia Institute of Technology, and Martin Olsson, University of California, Berkeley, for their very comprehensive review of the Department of Mathematics. We would also like to thank the Chair, Robert Jerrard, and faculty, administrative staff, and all those who contributed to the preparation of the self-study. We also want to thank the many staff, students, and faculty members who met with the external reviewers and provided thoughtful feedback. The UTQAP cyclical review process is an invaluable exercise that affords us the opportunity to take stock of our academic units and programs, to recognize achievement, and identify areas for improvement.

The review report was finalized on June 23, 2022, after which the Chair shared it widely with faculty, staff, and students in the Department of Mathematics. We are extremely pleased with the reviewers' positive assessment of the overall strength of the Department, its continued evolution in the undergraduate and graduate programs, and its outstanding, productive faculty. The reviewers described the department as "arguably the top mathematics research department in Canada and is among the strongest math departments in North America." The reviewers further noted that the recent hires have been impressive, and overall faculty are internationally

recognized, with many prestigious awards and excellent research achievements. The review report also raised several issues and challenges and identified areas for enhancement, including addressing enrolment pressures, student advising, planning for faculty growth, access to mentorship for faculty and graduate students, organizational and administrative structures, EDI processes, and space.

Each of these recommendations has been addressed in the attached Review Recommendations Table that outlines the Program's response, the Dean's response, and an Implementation Plan identifying action items and timelines for each recommendation. My Administrative Response and Implementation Plan was developed in consultation with the Chair and with senior leadership within my office. The Implementation Plan provided identifies timeframes of short- (six months), medium- (one to two years), and long- (three to five years) term actions and who (Faculty, Dean, unit) will take the lead in each area. I also identified any necessary changes in organization, policy, or governance where appropriate, as well as any resources, financial or otherwise, that will be provided, and who will provide them.

The next UTQAP cyclical review of the Department of Mathematics will take place no later than the 2029-30 review cycle. My office monitors progress on Implementation Plans through periodic meetings with Chair, and through the Department's five-year unit-level academic planning process, which will begin at the conclusion of the cyclical review. I also acknowledge that your office will request a brief Interim Monitoring Report midway between the April 2022 UTQAP cyclical review and the year of the next site visit in 2029-30 to report on progress made on the Implementation Plan as outlined in the accompanying Review Recommendations Table.

Thank you very much for the opportunity to respond to the review report. The reviewers' comments and recommendations will help inform the future priorities of the Department of Mathematics and its undergraduate and graduate programs.

Sincerely,



Melanie Woodin
Dean, Faculty of Arts & Science
Professor, Department of Cell & Systems Biology

CC.

Robert Jerrard, Chair, Department of Mathematics, Faculty of Arts & Science

Gillian Hamilton, Associate Dean, Unit-Level Reviews, Faculty of Arts & Science

Suzanne Wood, Special Advisor to the Dean on Unit-Level Reviews, Faculty of Arts & Science

Daniella Mallinick, Director, Academic Programs, Planning & Quality Assurance, Office of the Vice-Provost, Academic Programs

Andrea Benoit, Academic Review Officer, Academic Planning, Office of the Dean, Faculty of Arts and Science

2021-22 UTQAP Review of the Department of Mathematics - Review Recommendations

Please do the following for each recommendation in the table:

- If you **intend** to act on a recommendation, please provide an **Implementation Plan** identifying actions to be taken, the time frame (short, medium, long term) for each, and who will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy or governance; and any resources, financial and otherwise, that will be provided, and who will provide them.
- If you **do not** intend to act on a recommendation, please briefly explain why the actions recommended have not been prioritized.
- In accordance with the UTQAP and Ontario's Quality Assurance Framework, "it is important to note that, while the external reviewers' report may include **commentary** on issues such as faculty complement and/or space requirements when related to the quality of the program under review, **recommendations** on these or any other elements that are within the purview of the university's internal budgetary decision-making processes must be tied directly to issues of program quality or sustainability" (emphasis added)
- You may wish to refer to the [sample table](#) provided by the Office of the Vice-Provost, Academic Programs

In the **Program Response** column, draft responses appear in roman font and *discussion/comments, not meant for the eventual response, appear in italics.*

Request Prompt <i>verbatim from the request</i>	Rec. #	Recommendations from Review Report <i>verbatim from the review report</i>	Program Response	Dean's Response
<p>The reviewers observed that the Specialist program is very rigorous and offers limited flexibility for students to develop their interests, which severely limits "inclusion across multiple axes of diverse talent". They also noted concerns that "the bulk of faculty attention and possibly also other resources, is focused on the Specialist program." They recommended that the department conduct a review of curriculum and program administration with an eye to addressing structural issues identified in the Specialist; meeting the needs of undergraduates outside of the Specialist; and addressing broad student desire for better integration of curriculum with topics relevant to their post graduation plans.</p>	1	<p>"With the many changes in the student populations of the department it would be appropriate to do a review of curriculum and how the programs are administered. Related to this is a desire expressed by many students to have better integration of the curriculum with related fields relevant to students' post-graduation plans. Rather than have mathematicians teach such applications, it would make sense to consider how courses offered by other departments might be integrated into the program (and given the large amount of service teaching done by the department a strong case could be made for flexibility on enrollment restrictions)."</p>	<p>The Math Department serves a huge and diverse collection of students. In most recent data, over half of all student enrolments in Subject POSTs in the Science Sector of FAS are in Math, CS, or Statistical Sciences. Of these three departments, Math has the largest number of students and is the only department whose programs are currently all open enrolment.</p> <p>The Department agrees that our programs would benefit from a thorough review of our curriculum, which should be streamlined and modernized. There are opportunities to review prerequisites and allow students greater flexibility in switching programs. A first step, to be undertaken in the current</p>	<p>Short-term: The Dean's Office recognizes the enormously valuable service that the Department provides. The Vice-Dean, Undergraduate, will work with the Department on the curriculum review described in the unit's response. The Dean's Office would be happy to connect the Department with the Curriculum Development Specialist in the office of the Vice-Provost, Innovations in Undergraduate Education, for further conversations regarding learning outcomes and curricular development.</p> <p>Immediate-term: The reviewers commented on students' interest in integrating curriculum with their post-graduation plans.</p>
	2	<p>"Perhaps these [learning] outcomes could be revised, for the relatively few students who read such things"</p>		

			<p>academic year, will be to identify the resources necessary to carry out such a review. This is already a serious challenge -- due to the extremely large number of our students, their broad interests, and the small size (relative to student demand) of our faculty and staff complement, we have little spare administrative capacity for anything beyond day-to-day operations.</p> <p>We note that 7 out of the 8 specialist programs have a component in an adjacent field such as physics, economics and finance, probability and statistics, among others. Students in these programs take courses taught by faculty in those fields. In 4 of these programs, the Mathematics and its Applications Specialist Programs, the curriculum is explicitly designed to be integrated with related fields relevant to students' post-graduation plans. Additionally, math majors often double major, which inherently integrates their math major with another field. The Math Department also participates in the experiential learning Arts and Science Internship Program (ASIP) as of 2022. Last year we placed 20 students internships through the program, and are on track to accept another 20 students into the program for 2023-2024.</p> <p>In any future curriculum review, we will pay close attention to descriptions of program-level learning outcomes, as per Rec. #2.</p>	<p>Students from the Department's Specialist programs, as well as the Mathematics Major, are eligible to join the Arts & Science Internship Program, launched in Fall 2021. ASIP allows participating students to apply their academic learning to the world of work, build relevant skills, and explore future career options.</p>
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	3	<p>“Some voices were heard complaining that the specialist programs got rather more attention, with the majors program being left to the teaching faculty. While this is difficult to confirm, care should be taken to associate tenure-track faculty to all of the programs of the University, as is appropriate for any leading university.”</p>	<p>We completely agree with Rec. #3 and view this as a priority.</p> <p>Unfortunately, the math department is laboring under an extraordinary teaching burden -- the department’s FCE/FTE ratio, measuring the average teaching load (in terms of the number of students) per faculty member, is over twice that in the Faculty of Arts and Science as a whole, and this statistic does not take into account the large amount of teaching that math faculty do on behalf of FAS in the Faculty of Engineering. As a result of these extreme demands, we are forced to assign postdoctoral fellows to teach many 300-level courses. Among other drawbacks, this makes it very hard for many students to obtain reference letters from permanent faculty, putting our students at a disadvantage when applying to graduate programs and elsewhere. Significant improvement will require growth in the faculty complement and/or limits on the numbers of students that we teach. Marginal improvements are possible without such changes, but this would require tradeoffs, such as impoverishing other parts of our teaching program.</p>	<p>Medium- to long-term: The Dean recognizes the pressures on the Math Department and has been working with the Chair to support faculty hiring. The Department currently has four open searches, and the Dean expects the Department to request additional positions in the future, once these searches have been completed. Given that this is a highly competitive field, it can take time to hire the best faculty.</p>
	4	<p>“These issues [with ‘growing pains’ in the major program, with student advising supports, and with the lack of explicit support for underrepresented groups] are closely connected to the issue of understaffing and addressing them should be part of the department’s hiring plan tying the research and</p>	<p>Faculty complement planning is addressed below. The Department intends to work closely with the Dean’s office to ensure that undergraduate programs have adequate staff support.</p>	<p>Immediate-term: Administrative HR Services continues to work with the Department on ensuring appropriate staffing levels to meet its strategic objectives. Administrative HR Services have supported the Department in recruitments for 10 staff positions since</p>

		<p>teaching mission, in particular the majors mission, firmly together. And of course, then deliver.”</p>	<p>We will investigate opportunities, such as via our EDI Committee, to improve underrepresented student experiences in our classes, and look for ways we can provide additional advising support within the resources available to us.</p> <p>One challenge we face as a department is that we lack both faculty time and staffing to enable us to engage in this type of work. For example, we have over 2500 students enrolled in mathematics POSTs (major and specialist programs, accounting for about 20% of all subject POSTs in the science sector of FAS), and only two staff members whose duties include academic advising for undergraduates, each of whom has numerous other responsibilities to juggle. The perpetual labor shortage means that we struggle to complete daily tasks and not able to make progress on longer-term projects such as advising and equitable experiences. With additional staffing and support for faculty, we could do more with advising and attending to the underrepresented student experience.</p>	<p>January 2022. The Dean’s Office will work with the Department to add additional staff positions as needed.</p> <p>Short- to medium-term: Unit-level EDI committees in A&S have been very successful in working towards improving equity, accessibility, diversity, and inclusion within their units by seeking to address both current and future student, faculty, and staff experience through a wide variety of initiatives including attention to scholarships, curricular (and course) enhancements, seminars, and mentoring. The A&S Director of Equity, Diversity, &Inclusion will support the Department’s EDI committee in its ongoing work to improve the experience of underrepresented and equity-deserving students.</p>
<p>The reviewers observed enormous growth in the undergraduate program over past decade, fueled by enrolment caps in related majors; and noted that the huge numbers and varied interests of students put significant pressure on the department’s teaching mission. They recommended developing a strategic faculty</p>	<p>5</p>	<p>“Develop a plan for faculty growth. It is clear that the department needs to grow its faculty to meet the student demand. Most competing top math departments in North America have a 1-1 teaching load or equivalent, so the only way to meet the student demand is to increase the number of faculty. We also note that much of the increased student</p>	<p>The department agrees with Recs. #5 and 6, and we aim to develop a plan for faculty growth during the current academic year. This plan will be formulated following broad consultation with faculty members. We will work closely with the Dean’s office to project realistic rates of growth (Rec. #7). The</p>	<p>Short-term: The Dean’s Office recognizes the pressures on the Department and will work the Chair to address issues around growth in student demand. As noted above, this includes working with the Department on complement planning.</p>

<p>complement plan, and prioritizing the hiring of tenure-stream faculty when opportunities permit, while also considering the role of teaching-stream faculty and postdoctoral fellows in program delivery, aligned with support for program learning outcomes.</p>		<p>demand is in advanced math courses. The review committee therefore feels that the bulk of the increase should be in the form of tenure stream faculty. The review committee recommends developing a coherent plan for this increase linking it to the major's program. Such a plan should also include the role of teaching stream faculty and teaching post-doctoral fellows."</p>	<p>necessity for growth underscores the importance of the space issues highlighted in Recs. #27-30.</p> <p>Increased student demand for advanced courses, highlighted in Rec. #5, can be met both by an increase in tenure-stream complement and by assigning more advanced courses to teaching-stream faculty, as suggested by the external reviewers in Rec. #19.</p>	<p>Short- to medium-term: Following completion of the UTQAP review, the Dean will commission the Department's 5-year Unit-Level Plan (ULP). The ULP is a forward-looking document that both articulates a department's academic plans over the following five years and highlights progress made on the implementation plan identified in the UTQAP administrative response. The Chair will work with the Vice-Dean, Academic Planning, to develop a ULP that addresses such key areas as curriculum change, EDI, and complement planning. The development of the ULP involves significant consultation with faculty, staff, and students. Through the ULP process, the Dean's Office works with units to address issues such as program growth and space planning.</p> <p>Medium- to long-term: As noted in our response to #5 above, the Dean's Office will work with the Department to develop a Unit-Level Plan that includes complement planning, faculty development, partnerships with other units, and potential plans for growth. As with all units at the University, the workload policy is a collegial process within the unit subject to decanal approval. The ULP process is an opportunity for departments to engage with the Dean's Office on issues raised in the review process, including workload, faculty complement, and the</p>
	6	<p>"As indicated previously, the enormous student demand necessitates growing the faculty, and one of our principal recommendations is to develop a coherent plan doing so. Of course, such a plan would necessarily be adjusted with time, but a vision for a sustainable steady state would be helpful. Some things to consider in such a plan include (but is not limited to):</p>		
	7	<ul style="list-style-type: none"> Establishing a realistic rate of hiring. Hiring at the very high level of the department is challenging and growth of the faculty will have to be a long-term effort. 	<p>Recs. #7-11 address criteria that will need to be considered in developing a faculty growth plan. The department agrees that these need to be taken into account.</p>	
	8	<ul style="list-style-type: none"> Determining areas for scientific growth in the department. There appear to be opportunities for growth in applied mathematics and in connections with the new School of Computational and Data Science. 	<p>In addition, the Review Report suggests that the department may be unable to maintain its high research standing with current teaching loads. This suggestion is implicit in Recs. #5 and #14, as well as in the Review Summary ("maintaining a department at this very high level requires constant attention, especially in the context of competition with the very top North American universities.") It</p>	
	9	<ul style="list-style-type: none"> The appropriate or optimal balance between tenure stream faculty and teaching stream faculty. 		
10	<ul style="list-style-type: none"> Connections between the suburban campuses and the St. George campus may offer some 			

		opportunities, especially in the context of space constraints.	is also consistent with recent experience; tenure-stream hiring at our level has become more difficult as teaching loads decrease at peer institutions. Discussions of complement planning and of the appropriate balance between teaching and tenure streams will take this factor into account, while also prioritizing the needs of the major programs.	balance between tenure and teaching stream faculty.
	11	<ul style="list-style-type: none"> The needs of the major programs, including questions of staffing the courses as well more broadly the appropriate level of engagement of faculty” 		
	12	“Given their expertise and experience, there appear to be many opportunities to integrate [teaching stream faculty] into the teaching leadership of the undergraduate programs. Of course, this would require rebalancing their workload accordingly. Given the recent institutional changes to support promotion and retention of teaching faculty, this appears to be the ideal time to consider a variety of possibilities.”	As of July 1, 2023, a teaching stream faculty member (Stan Yoshinobu) began a 3-year term as Associate Chair for Undergraduate Studies. In recent years, teaching stream faculty have been well-represented on the department’s Undergraduate Committee, EDI Committee, Teaching-stream Hiring Committee, Merit Committee, and Workload committee, and we expect this to continue.	Short- to medium-term: The Vice-Dean, Faculty and Academic Life, will be pleased to support the Department in its efforts to integrate teaching stream faculty into teaching leadership of the undergraduate program.
	13	“There are excellent examples from the department’s peers (e.g., UBC and others) of how to optimize the cooperation of teaching and research faculty in these areas, which may be valuable for exploration.”	<p>Teaching stream faculty play a vital role in helping the department meet our massive teaching obligations. They also provide essential training for new TAs and instructors, which is key to the professional development of grad students and postdocs. Continuing or expanding teaching stream involvement in administrative roles will require growth of the teaching stream complement to ensure that these functions are still carried out well.</p> <p>The department chair has arranged meetings with chairs of other top Canadian math departments, such as McGill and UBC, at which issues such as those raised in Rec. #13</p>	

			could be discussed. Such meetings will begin in fall 2023.	
	14	“... the department is competing with top universities for faculty, and is somewhat disadvantaged in terms of the teaching load and the financial compensation it can provide. It has been very successful in identifying outstanding candidates with a particular attraction to Toronto. It is important to maintain this flexibility in hiring. That said, the review committee wonders if incorporating some priority areas into the hiring process may be beneficial (this may already be occurring informally).”	In developing a plan for faculty growth, as discussed in our response to Recs. #5 and 6, the question of identifying priority areas will be considered carefully and with broad input from faculty members.	Medium- to long-term: The Dean’s Office will work with the Department on complement planning, as noted in our response to #5 above.
The reviewers recommended exploring ways to enhance and coordinate supports and advising for graduate students throughout the duration of their programs.	15	“Mentorship at multiple levels. Within the informal structure there were various gaps in mentorship, particular for grad students and faculty in their first several years in the department. This is a critical time during which access to mentorship is key. Likewise, as there was no meeting scheduled with the postdocs, it would be good to review their mentorship structure.”	The Department already employs multiple means -- written resources, staff assistance, Q&A sessions, peer mentoring -- for informing grad students about the nuts and bolts of the graduate program and topics such as applying for scholarships and selecting an advisor. The Graduate Committee has begun to consider ways of enhancing our mentorship structure and expects to begin implementing improvements within the next year. Possibilities under discussion include assigning faculty and/or senior graduate student mentors to all incoming graduate students. The Department recently introduced an annual grant-writing workshop that provides useful professional training and has markedly improved the department’s success rate in national grant competitions for graduate awards. We intend to introduce other	Immediate- to medium-term: In the Fall of 2022, the Vice-Dean, Graduate Education, set up the Doctoral Student Success Advisory Committee (DSSAC), with representation from staff, faculty, and students across the three sectors, to examine graduate student progress, including time to degree. DSSAC recommended two tracks of support to students: first, considering how we might improve awareness, usage, and the effectiveness of the group-based programming that we already offer (such as the Milestones & Pathways program as well as writing support), and second, developing a new capacity to offer more individualized supports for those students who face an unusually complex combination of issues. Part of the remit of DSSAC is improving how we communicate the supports that already exist, both directly to graduate students (through our presence online) as well as
	16	“The department should ensure that graduate students are mentored at all stages of their program, also as TA’s. In addition, while graduate students noted the excellent support of department staff members, more points of access and capacity for support of graduate students would be helpful.”		

			<p>professional development workshops on this model, to guide students on topics such as writing a first paper or applying for academic jobs. We also have regular events introducing possible non-academic careers to students.</p>	<p>ensuring that units – often the first place that students turn for support – have the most accurate and up-to-date information in order to improve their referrals. To this end, we have begun a review of our communication strategy as well as establishing a comprehensive resource base for unit-level staff that will serve as a single repository for all of the relevant information.</p> <p>Supervision, which can have a significant impact on a student’s academic progress and overall graduate experience, continues to be a focus of discussions, including in DSSAC as outlined above. The School of Graduate Studies (SGS) has established the Centre for Graduate Mentorship & Supervision, along with a set of guidelines outlining best practices for supervision. We continue to partner with SGS on such initiatives, careful not to duplicate but to complement what they are doing and, where necessary, to fill any gaps that are particular to our (A&S) students. Much of this involves working closely with the leadership and staff in our graduate units.</p> <p>The Vice-Dean, Graduate Education, will work with the Department to address issues of graduate student mentorship and advising.</p> <p>Short-term: The Faculty has also recently launched a new Office of Graduate Professional Development & Student Success (GPDSS). The GPDSS Office is available to support the Department in the development and delivery of graduate student professional</p>
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				development activities, as well as exploration of alternative-academic careers.
The reviewers noted a relatively informal departmental organizational structure, as well as some disconnect between its various faculty groups. They recommended exploring approaches to strengthen the cohesiveness of the department, observing opportunities to enhance departmental communications, and to encourage the participation of all faculty groups in departmental activities and administration.	17	“Administrative structure. As noted, the current situation is an informal one, with everything basically being delegated from the chair. This has functioned, by and large, but complaints were made about lack of communication, and this in turn can lead to alienation. While we do not advocate burdening the faculty with excessive faculty meetings, and understand that while a faculty meeting takes place each term, more could be done to improve communication flows. There is apparently an elected Advisory group in the Department’s constitution that has been dormant for a while. Perhaps this could be revived.”	<p>The Department has meetings once per semester to which faculty, postdocs, graduate students, and staff are all invited. These meetings, which go by the name “Department Council”, are always well-attended, with a majority of faculty present. Department Council meetings always include reports from the Chair and Associate Chairs covering most of the topics listed in Rec. #18.</p> <p>The “elected advisory group in the Department’s constitution” was never in fact dormant. However, the election procedure spelled out in the department’s constitution was not followed properly for a few years. This technical lapse, which seems to have been mistaken by the Review Committee for dormancy, was rectified during the 2022-23 academic year.</p> <p>The broader point that more communication would be helpful is well-taken, and the Chair’s office is working on this issue. For example, in formulating this Administrative Response, draft responses and related discussion have been circulated to the entire faculty, and opinions solicited. This has been done via email, online polling, and meetings with particular constituencies and with any individual who expresses an interest. We plan to make some of these communication strategies a routine feature of department governance.</p>	Short- to medium-term: The Dean’s Office notes that the Chair is working to improve communications within the unit. The Vice-Dean, Faculty and Academic Life, will work with the Chair to support the institution of regular faculty meetings and development of effective channels of communication.
	18	“A few committee reports would at least keep people on the same page, generate more input on important topics such as curriculum, the undergraduate and graduate programs, hiring, and EDI, and facilitate smoother transitions when key roles are reassigned. The department’s constitution already has an elected representative council; perhaps it could be revived.”		

	19	<p>“Take steps to form a more integrated faculty. The contributions of the teaching stream faculty are manifold. The review committee perceived a disconnect between the teaching stream and tenure stream faculties. Part of this has to do with space: Informal interactions in the hallways would obviously help. But the department would do well to recognize the contributions of the teaching stream faculty and to provide opportunities to engage with department efforts more fully. Though we note that the workload of the teaching stream faculty seems heavy so additional duties would have to be considered in the overall expectations. Such opportunities could include access to more specialized courses, and involvement with the running of the programs.”</p>	<p>The department recognizes the need to create a more integrated faculty to support connections between the teaching stream and tenure stream faculty. We plan to increase the number of formal and informal gatherings that promote collegiality – this has already begun -- and to pursue greater integration in course assignments. Course assignments for all faculty, tenure- and teaching-stream, should balance the needs of the teaching program with opportunities for intellectual and professional growth. We expect this balance to result in more assignments of teaching-stream faculty to advanced or specialized courses as the teaching-stream complement grows.</p> <p>As noted above, one of the teaching stream faculty is the current undergraduate chair. Teaching Stream faculty are always well-represented on departmental committees, including the Undergraduate Committee, all teaching stream Search Committees, the Merit Committee (responsible for PTR scoring) and the EDI Committee, whose chair was a teaching stream faculty member for the past couple of years. It is also noted that most of the teaching stream faculty are still in an early-career phase (assistant professors) and were hired in the past 5 or 6 years. Hence, leadership roles and opportunities will</p>	<p>The Dean recognizes that the Department is making efforts to promote collegiality among their faculty.</p> <p>Short-term: The Dean’s Office supports new faculty, including teaching-stream faculty in Math, through the new Arts & Science New Faculty Program, a novel multi-year initiative. The Program includes a series of lunch and learn workshops offered over the course of the new faculty’s first two years at A&S and covers a range of topics pertinent to the experiences of newly hired faculty including teaching at the University, promoting equity in research teams, and supporting student mental health. These workshops are complemented by social opportunities that promote community and a sense of belonging both within A&S and the University at large. The new Faculty program provides a means of building community among faculty members, teaching and tenure stream, within and across units.</p> <p>Short-term: In addition, the Vice-Dean, Faculty and Academic Life, is available to support the Chair in developing strategies to better connect teaching and tenure stream faculty in the Department.</p>

			be areas of growth that are linked to the natural evolution of their career trajectories over the next 5 to 10 years.	
	20	“Given the talent in the department across the board, investment in communications is well worth it.”	During the 2022-23 academic year, the Department created (with the support of the Dean’s office) and filled a Communications Officer position, and this officer is undertaking a number of initiatives to improve department communication, both internal and external. As noted in our responses to Recs. #17-8, we are also taking steps to improve communication flow in department governance.	Short-term: The A&S Office of Communications and Public Affairs will be pleased to work with the new Communications Officer.
	21	“The problem with the turnover in the student services staff appears to stem from the fact that the position needs to be reclassified - this should be a priority for the new manager. Also, adding additional support for undergraduate teaching may be appropriate.”	In the most recent academic year, math faculty taught 4 H courses and 3 Y courses – the equivalent of 10 H courses -- with enrolments of over 1000 students. This is almost one third of the 31 such H-course equivalents in all of FAS in the same year, and it does not count our teaching on behalf of FAS in the Faculty of Engineering, which includes a couple more classes of roughly 1000 students. Instructional support staff provide course coordinators with essential help with the enormous logistical tasks involved in managing these ultra-large courses. The Department looks forward to working with Administrative HR Services in reviewing the staffing level to ensure that these positions are appropriately resourced to continue to run a number of the largest classes in the Faculty.	Short-term: Administrative HR Services looks forward to working with the Department on reviewing its staffing level to ensure alignment with the Department’s strategic objectives.

			<p>Additional staff support for undergraduate teaching is indeed needed – many ultra-large courses presently do not have adequate staff support. A serious obstacle is the lack of office space.</p>	
<p>The reviewers observed that Equity, Diversity and Inclusion was a topic of great interest in their discussions with students and some other department members; however that EDI received little attention in the self-study and in meetings with leadership. They urged the department to explore strategies to strengthen its EDI efforts and processes, particularly in relation to faculty hiring and graduate student recruitment.</p>	<p>22</p>	<p>“Equity, Diversity and Inclusion (EDI). There seemed to be a lack of process in some critical areas such as hiring of new faculty and recruitment of graduate students. The processes to make sure EDI is covered not only can lead to better results but can also protect the Department in an area in which it appears rather vulnerable.”</p>	<p>There is always room for improvement in processes to ensure EDI considerations in recruitment, and the Department, through both the Chair and the departmental EDI Committee, will continue to look for opportunities and seek guidance from the Faculty of Arts and Science (e.g., the A&S Director, Equity, Diversity and Inclusion) and the SGS.</p> <p>With that said, the Department follows FAS and U of T processes in faculty recruitment, taking our guidance from sources such as VPFAL’s <i>Strategies for Recruiting an Excellent and Diverse Faculty Complement</i>. These include careful attention to creating a job ad that encourages applications from a wide range of excellent candidates and to posting the ad in venues where it will be seen by diverse candidates, actively soliciting applications from excellent candidates who would enhance our diversity, relying upon inclusion rather than exclusion strategies in making selection decisions, referring back to the published criteria in all discussions of candidates, and so on. Every search committee has at least one Dean’s Rep (often more, as we typically use a single committee to carry out multi-campus searches) to ensure compliance with these processes, particularly with respect to EDI. The deliberations of search committees are necessarily confidential. While this</p>	<p>Short-term: As a strategic priority of the Faculty’s five-year plan (2020-2025), Arts & Science is firmly committed to improving equity, diversity, and inclusion among students, staff, and faculty. The Faculty added new training for chairs and directors in 2020-21 to ensure that EDI is supported within departments. Furthermore, as a new component of the annual activity report, chairs and directors are now evaluated on their progress in enhancing EDI within their unit. The A&S Director, Equity, Diversity & Inclusion, is available to meet with the Chair to discuss EDI-relevant planning within the unit.</p> <p>Short-term: The Director, Academic HR, and the Vice-Dean, Faculty and Academic Life, are available to offer guidance to the Chair to ensure that the Department is using effective strategies in faculty searches. The Faculty provides training sessions for Chairs regarding the search process, including the incorporation of EDI considerations.</p> <p>Short-term: The Vice-Dean, Graduate Education, is available to offer advice regarding strategies relevant to graduate recruitment.</p>

			<p>confidentiality does not extend to processes, it nonetheless envelops committee operations in a veil of opacity that may be partly responsible for the appearance of a lack of process.</p>	
	23	<p>“The leadership of the department would do well to engage with [EDI] more visibly - this seems to be a potential weakness. As a first step, the department should at least gather data (the administration likely already has a lot of information) to understand this issue better. The department should recognize the work of department members on this issue and continue to support groups such as the AWM chapter.”</p>	<p>In the 2022-23 academic year, the Dean’s office, with the support of department leadership, commissioned a Climate and Culture Assessment to “examine the departmental climate and culture, morale, leadership and the extent to which the working and learning environment, for all members within the unit, reflects the Faculty and University’s shared values of equity, inclusion and respect.” As this Administrative Response is being drafted, we are still waiting for the results of this Assessment, but when completed it will yield both data and recommendations that will direct the Department’s next steps on these issues. We also recognize that this Assessment devoted relatively little attention to some key EDI-related areas, such as the undergraduate experience, and we intend to work with the Dean’s office to devise ways to gather more information on these.</p> <p>The department is delighted to support the work of groups such as the Association for Women in Mathematics (AWM) chapter, and</p>	<p>Short-term: In addition to supporting the Unit with a Climate and Culture Assessment, the Faculty recognizes the importance of EDI data and has been developing dashboards for units that will provide information on (as a first step) the gender composition of both their student population and teaching complement.</p>

			<p>we will explore ways to recognize the work of department members on this issue. Recent and ongoing EDI-related initiatives include work of our K-12 outreach office, a focus of which is outreach to underrepresented groups; our co-sponsorship with CS in fall 2022 of several performances of a play, <i>Truth Values</i>, exploring the challenges faced by women in mathematics; and the Equity Forum, a department lecture series that gives voice to the perspectives of marginalized groups within mathematics.</p>	
<p>The reviewers noted opportunities to enhance connections with cognate units; in particular, with colleagues in computational and data science.</p>	24	<p>“Relations with other departments. Some regularly scheduled get togethers might be beneficial. For example, informal conversations around curriculum would make sense given the changing landscape of undergraduate teaching.”</p>	<p>We agree that informal communication and discussion with other departments about curriculum is beneficial. Some of these conversations have already been happening, as we have faculty involved in discussions with Engineering, Commerce. We intend to continue to reach out informally to our colleagues in other departments as appropriate.</p>	<p>Short-term: The Dean’s Office recognizes the efforts that the Department has been making to engage in informal collaborative discussions, and the Vice-Dean, Undergraduate, would be happy to facilitate any discussions, where appropriate and if needed.</p>
	25	<p>“The School of Computational and Data Science is one opportunity that the department should not miss. The intellectual connections between data science and mathematics are strong, and it would be mutually beneficial to maintain strong and vibrant ties”</p>	<p>The Department remains committed to the projected School of Computation, and we note that it will facilitate the kinds of discussions mentioned in Recs. #24 and 26..</p>	<p>Medium-term: At the time of the site visit, discussions were ongoing regarding the possibility of a School for Computational and Data Science. Although the Faculty has not necessarily decided against a School, current discussions are instead focused on the roll-out of the Faculty's plans for a new budget model. The new model, currently in the pilot phase, will give considerably more autonomy to units, and would have implications for the administration of a School. Once the new budget model is in place, the Dean's Office would be happy to re-open the discussion</p>

				regarding the School if the relevant units wish to pursue it.
	26	“Regular discussions around curriculum [with cognate units] seem appropriate given the overlapping interests of the students served.”	<p>The Department has a long history of cooperation with the Faculty of Applied Science and Engineering on curricular issues, and we are currently working to set up a formal committee structure in the Math Department to keep the engineering-math partnership healthy, address changing engineering students’ needs, and stay current with teaching innovations.</p> <p>Math department members routinely consult with other departments in FAS when making significant changes to courses that serve many students from other programs. These consultations are carried out on an ad hoc basis, and having structures to support them would be beneficial. We also point out that because students from a vast number of programs take math courses we frequently work with other departments on curricular issues. One challenge is that these efforts require a significant amount of staff time and faculty time, and more support is needed to sustain these efforts.</p>	<p>Short-term: The Vice-Dean, Academic Operations, and the Vice-Dean, Undergraduate, work with their counterparts in the Faculty of Applied Science and Engineering to co-chair regular joint meetings between representatives of units that engage in interdivisional teaching. These meetings aim to promote communication between the divisions regarding teaching and curricular needs, priorities, and changes. In addition, we note that the Department is engaged in more informal, ongoing communications with other departments. The Dean’s Office is happy to support all these processes as needed.</p>
The reviewers noted the potential impact of departmental space concerns in a number of areas, including instruction, faculty research and hiring processes, and the department’s overall global competitiveness. They	27	“Address the space issue. This is, perhaps, a recommendation more appropriately addressed to the Dean’s office or higher-level administration, and its solution will necessarily involve intricate knowledge of the University, so this committee is not	We agree with Rec. #29 and with related remarks in the External Review Report, which follows the verbatim quote presented in Rec. #29 by writing: “The case for supporting the math department in this regard is clear: The	

recommended that the department work with the Dean's office to strategically examine space concerns and address as appropriate.		in a position to be prescriptive. We do note, however, that space issues are limiting hiring, affecting the work of the staff, contributing to a lack of cohesiveness of the faculty, and conditions for graduate students that are inferior to those of other top graduate programs, just one sign that the space issues are affecting the competitiveness of the department. We also agree with the need expressed by the suburban campus faculty for office space on the St. George campus. We note that many of the pressures on the department are created by taking on the broader service mission of teaching students excluded from other majors, most notably Statistics and Computer Science, yet those other departments do not seem to have the same space constraints."	math department is one of the top math departments in North America, doing a huge service to the university as a whole through its teaching and by providing an avenue for STEM majors who have been excluded from other departments on campus."	Space is an ongoing issue for many units within the Faculty. Some units have grown in recent years, resulting in an urgent need for new faculty offices, labs, and student space. Finding this space, along with making much-needed improvements to some of our existing spaces, has become one of the most significant, ongoing challenges for the Office of the Dean. Space is at a premium downtown, and soaring inflation has dramatically increased building costs, delaying some projects.
	28	"Improved space would certainly have a positive impact on graduate student research."	As the Review Report makes clear, the space problem affects every aspect of the Math Department's functioning. To the list of negative impacts in Rec. #27 we can add conditions for postdoctoral fellows that are inferior to those of other top departments (and getting worse – this year the space shortage has forced us to convert many postdoctoral offices from 2-person offices to 3-person), numerous offices that completely fail to meet basic accessibility standards, inadequate space for research, teaching, and administrative meetings.	Long-term: In the longer term, the Faculty is planning for the creation of a computation sciences cluster with a new building that will include the Departments of Computer Science, Mathematics, and Statistical Sciences.
	29	"This is a problem [space accommodations for personnel] that cannot be solved by the department and requires work of the administration."		
	30	"The interactions between the campuses appears healthy, and a key component of this is the fact that the faculty from the suburban campuses have office space at the downtown campus. This is crucial. Exploring further opportunities to integrate the suburban campuses in the research environment may also be fruitful in thinking about the space issues."	Our colleagues at UTM and UTSC are fully integrated in the research environment. They regularly teach graduate courses, they supervise graduate students and postdocs. Seminars and other research activities are scheduled to facilitate participation of faculty and other researchers from all campuses. All departmental committees related to the tri-campus graduate department, such as those	The Dean appreciates the measures that the Department has taken to ensure tri-campus engagement in areas such as hiring and the graduate program.

			concerned with tenure-stream hiring, the graduate program, the postdoctoral program, EDI, have members from all three campuses.	
Other recommendations not prioritized in the Request for Administrative Response	31	<p>“One issue noted is the relatively low number (a fraction of what is the case at several other Canadian universities) of NSERC summer undergraduate research awards taken up by department students. Some systematic effort at recruitment would be warranted, as undergraduate research is now an important feature of specialist-type programs across the continent, and indeed provides a strong leg-up for admission to graduate school.”</p>	<p>There is enormous unmet need for undergraduate summer research experience in math, reflecting the large size of our undergraduate programs -- among the largest in the science sector of FAS, as well as within FAS as a whole. Many math faculty are eager to mentor students, so the limiting factor has been the number of NSERC summer research awards the department is allocated. This year (summer 2023) the department initiated Math Department Summer Research Awards, funded from our operating budget, to provide research experience to more students. The program was a great success, doubling the number of students who held summer research awards in math.</p> <p>It should be noted that the number of NSERC USRAs we are allocated is far less than at other top Canadian math departments: for example, in 2023, we had 5 at the U of T, vs 12 at UBC and 15 at McGill. Moreover, our number of NSERC USRAs was less than 7% of the total in FAS, whereas by any reasonable measure – HCE taught, number of students in our programs – our share of Science Sector undergrads is closer to 20%.</p> <p>For these reasons we intend to vigorously make the case to anyone who will listen that we should have a larger allocation of NSERC USRAs and other awards, and to continue to</p>	<p>Short-term: The Faculty recognizes the importance of engaging with the excellent math undergraduate students through the NSERC USRA program. Across the institution, there are not enough awards to fill the demand. To address this issue, the University developed its own program (UTEA), but again, demand outstrips the number of available awards. Many of our departments have, like Math, developed their own summer initiatives to increase the number of awards.</p>

			make this case until the current policies, which lead to a serious misallocation of USRAs, are corrected.	
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3 Committee on Academic Policy & Programs (AP&P) Findings

The spokesperson for the reading group reported that review summary had accurately reflected the full review and that the administrative response fully addressed the issues identified. The reviewers highlighted the consideration of unacknowledged potential of cross-disciplinary collaborations outside of the Faculty of Arts & Science, and that a brief follow-up report on EDI in one year would be useful for illustrating how the short-term plans were unfolding.

Poppy Lockwood, Vice-Dean, Academic Planning responded that similar to the aforementioned Department of Computer Science review, there would be an interim monitoring report in 3-years, and the Faculty would be working on EDI initiatives in the interim as well, and asked if the review group would consider the 3-year time frame rather than the one-year time frame.

No follow-up report was requested as the reading group was satisfied with the 3-year interim monitoring report.

4 Institutional Executive Summary

The reviewers praised the department as “outstanding,” conducting world-class research and serving a huge number of students in its teaching mission. They noted that it is arguably the top mathematics research department in Canada, and among the strongest in North America. Faculty are internationally recognized and have received a number of prestigious awards; their research achievements are excellent; recent departmental hiring is “particularly impressive”; and teaching stream faculty have made some pedagogical innovations. They observed that faculty, staff and students all display great commitment to the mission of the department and University; satisfaction appears strong among students in the Specialist program; and that the graduate program seems to be “sound and running” well, and graduate students appear happy with their degree and supervision.

The reviewers recommended that the following issues be addressed: Conducting a review of undergraduate curriculum and program administration with an eye to addressing structural issues identified in the Specialist, meeting the needs of undergraduates outside of the Specialist, and addressing broad student desire for better integration of curriculum with topics relevant to their post graduation plans; developing a strategic faculty complement plan, and prioritizing the hiring of tenure-stream faculty when opportunities permit, while also considering the role of teaching-stream faculty and postdoctoral fellows in program delivery, aligned with support for program learning outcomes; exploring ways to enhance and coordinate supports and advising for graduate students throughout the duration of their programs; exploring approaches to strengthen the cohesiveness of the department, observing opportunities to enhance departmental communications, and to encourage the participation of all faculty groups in departmental activities and administration; exploring strategies to strengthen departmental EDI efforts and processes, particularly in relation to faculty hiring and

graduate student recruitment; exploring opportunities to enhance connections with cognate units; in particular, with colleagues in computational and data science; and working with the Faculty Dean's office to strategically examine space concerns and address as appropriate.

The Dean's Administrative Response describes the Faculty and unit's responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result.

5 Monitoring and Date of Next Review

The Dean will provide an interim report to the Vice-Provost, Academic Programs no later than midway between the April 2022 UTQAP cyclical review and the year of the next site visit on the status of the implementation plans.

The next review will be commissioned no later than the 2029-30 review cycle.

6 Distribution

On June 30th 2024, the Final Assessment Report and Implementation Plan was posted to the Vice-Provost, Academic Programs website and the link provided by email to the Dean of the Faculty of Arts and Science, the Secretaries of AP&P, Academic Board and Governing Council, and the Ontario Universities Council on Quality Assurance. The Dean provided the link to unit/program leadership.