
11

We continue to strengthen our leading-edge educational and research programs through prudent management of our financial and physical resources — funding, space, infrastructure and talent — and strategic investment in new initiatives.

The Myhal Centre for Engineering Innovation & Entrepreneurship is the most ambitious capital project to be completed in many years, for which our Faculty fundraised and invested more than \$90 million. Its technology-enhanced active learning spaces, fabrication facilities and design studios are setting a new standard in experiential education and research. The Myhal Centre catalyzes collaborations among students, faculty, staff, alumni and external partners, and strengthens our commitment to driving innovation, facilitating entrepreneurship and preparing the next generation of global engineering leaders.

Over the past two years, we have also invested \$19.1 million (matched by \$13.4 million from the federal government's Strategic Investment Fund) in renovations to 89 laboratory facilities across our Faculty through the Lab Innovation for Toronto (LIFT) project. This includes everything from a new bunkhouse for students at the site of our Civil and Mineral Practicals (CAMP) at Gull Lake to renovated labs in the Rosebrugh and Wallberg buildings.

In 2018–2019, we committed \$11.4 million to new Dean's Strategic Fund (DSF) projects that support multidisciplinary research collaborations, new experiential learning programs and other projects with broad impact on our Faculty. The Engineering Instructional Innovation Program (EIIP), an extension of the DSF, continues to foster curriculum innovation through strategic investments aimed at enhancing teaching, learning and the overall student experience.

We have also invested in student support and success, with a further \$4.5 million to match donations toward the Decanal Chair in Innovation, the Frank Leslie Haviland Scholarship, and the Troost Institute for Leadership Education in Engineering.

Total Revenue and Central Costs

The Faculty's total revenue and associated costs are reflected in Figures 11.1 and 11.2. Revenue in 2018–2019 grew to \$238.0 million, an increase of 1.7% over 2017–2018, with a compound annual growth rate of 6.6% since 2009–2010.

With the completion of many of the major infrastructure projects that were covered by operating funds in 2019, and the funds in place for several upcoming projects — including the new building at Gull Lake, the landscaping on the St. George frontage of the Galbraith Building, and the upgrades to the Engineering and Computer Science Library — we have strategically planned to reduce the undergraduate student population, with the goal of achieving our target undergraduate-to-graduate ratio of 60:40.

Total central costs for 2018–2019 rose to \$112.2 million, a 6.3% increase over 2017–2018, with a compound annual growth rate of 5.9% since 2009–2010. Central costs include the student aid levy, University fund contributions and University-wide costs, which experienced year-over-year increases of 5.4%, 2.0% and 7.5%, respectively (Figures 11.2 and 11.3). Major drivers of the costs for this year included the new occupancy cost of the Myhal Centre, new acquisitions at U of T Libraries, and service level increases in student recruitment, registrarial and research administration functions.

Figure 11.1 Total Revenue, 2009–2010 to 2018–2019

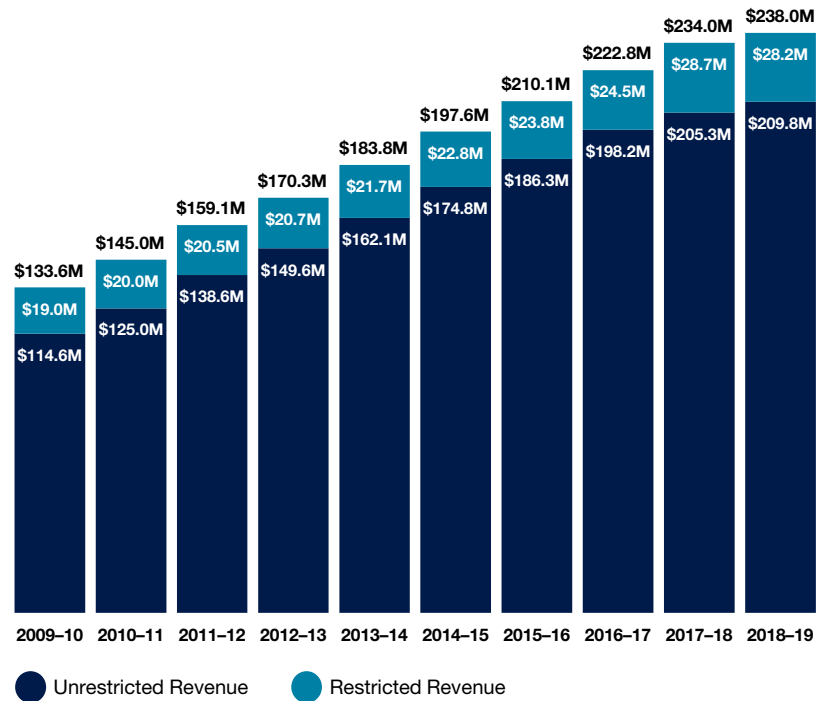
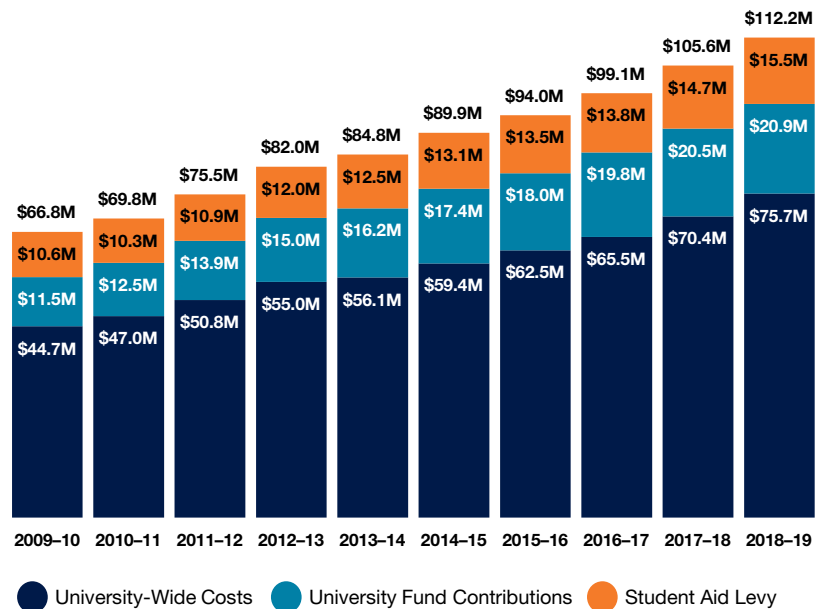


Figure 11.2 Total Central Costs, 2009–2010 to 2018–2019



Data in this chapter are presented by fiscal year (May to April).

The rise in our student aid levy is part of our commitment to providing need-based assistance to all students. U of T's Student Access Guarantee makes this goal clear: "No student offered admission to a program at the University of Toronto should be unable to enter or complete the program due to lack of financial means." Student aid ensures we continue to attract the very best students regardless of their financial situations, and includes centrally administered awards, such as the Pearson Scholarships, as well as internal Faculty awards, such as the International Scholar Awards.

University-wide costs include caretaking, utilities, central human resources, student services, information technology, central library, advancement and research services.

Key spending initiatives included:

- Increased funding toward reducing deferred maintenance
- Upgrades and revitalization of classrooms
- Electronic acquisitions for our libraries
- Additional support for inventions and commercialization
- Development of a new student information system
- Improved on-campus Wi-Fi connectivity
- Completing the Boundless fundraising campaign

Figure 11.3 Budget Data, 2009–2010 to 2018–2019

	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Unrestricted Revenue	\$114,602,697	\$124,966,518	\$138,597,605	\$149,615,656	\$162,048,175	\$174,819,446	\$186,298,686	\$198,246,669	\$205,332,615	\$209,797,947
Restricted Revenue	\$18,969,092	\$20,009,763	\$20,483,566	\$20,726,973	\$21,737,177	\$22,751,425	\$23,766,755	\$24,525,299	\$28,686,839	\$28,225,383
Total Revenue	\$133,571,789	\$144,976,282	\$159,081,170	\$170,342,629	\$183,785,352	\$197,570,871	\$210,065,441	\$222,771,967	\$234,019,454	\$238,023,330
Inter-Divisional Teaching Revenue Transfer							\$6,042,335	\$5,084,764	\$5,028,443	\$5,174,097
University-Wide Costs	\$44,693,620	\$47,027,056	\$50,817,454	\$55,028,273	\$56,089,556	\$59,390,462	\$62,461,112	\$65,553,462	\$70,384,637	\$75,690,514
University Fund Contributions	\$11,460,270	\$12,496,652	\$13,859,760	\$14,961,566	\$16,167,220	\$17,443,377	\$17,985,353	\$19,787,234	\$20,496,107	\$20,943,690
Student Aid Levy	\$10,614,513	\$10,313,864	\$10,859,371	\$11,995,084	\$12,539,417	\$13,093,888	\$13,541,938	\$13,793,571	\$14,716,594	\$15,542,692
Total Central Costs	\$66,768,403	\$69,837,572	\$75,536,585	\$81,984,923	\$84,796,193	\$89,927,727	\$93,988,403	\$99,134,267	\$105,597,337	\$112,176,896
Net Revenue	\$66,803,386	\$75,138,710	\$83,544,584	\$88,357,706	\$98,989,159	\$107,643,144	\$110,034,703	\$118,552,936	\$123,393,674	\$120,672,337

Budget Overview

Our revenue sources, attributed central costs and budget breakdown for 2018–2019 are shown in Figures 11.4, 11.5 and 11.6, respectively. Net revenues are down by 2.2% year-over-year, driven primarily by the year-over-year increase in our share of University-wide costs. The provincial grant per domestic student has not increased in a number of years, and a more selective admissions process coupled with lower overall undergraduate student enrolment targets have effectively offset the impact of tuition increases.

Major strategic initiatives pursued over the last several years include the Myhal Centre for Engineering Innovation & Entrepreneurship construction and matching for the Lab Innovation for Toronto (LIFT) project, which upgraded infrastructure in several facilities across the Faculty.

Prudent budgeting and fiscal management across the Faculty have allowed us to grow our reserves and invest in upgrades to existing classrooms and laboratories, the Dean's Strategic Fund (DSF) and the Dean's Infrastructure Improvement Fund (DIIF) initiatives.

We still maintain an internal loan of \$4.0 million with the University, which was used to aid their purchase of the neighbouring Centre for Addiction and Mental Health (CAMH) facility, an investment that will benefit future generations of faculty and students.

Figure 11.4 Revenue Sources, 2018–2019

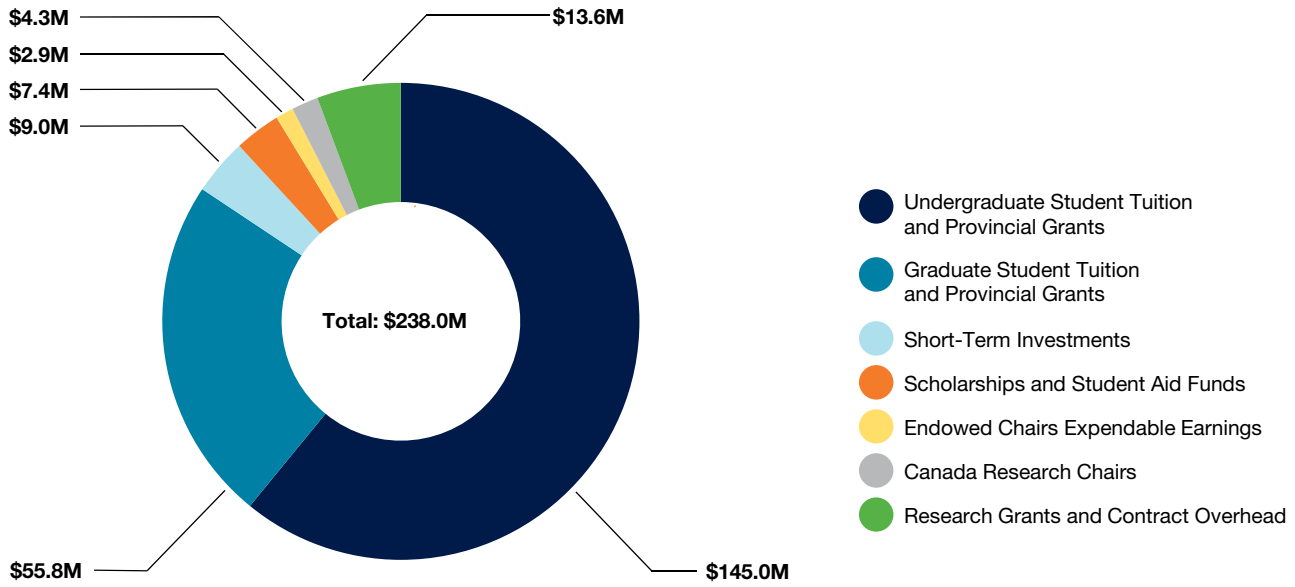


Figure 11.5 Revenue Distribution, 2018–2019

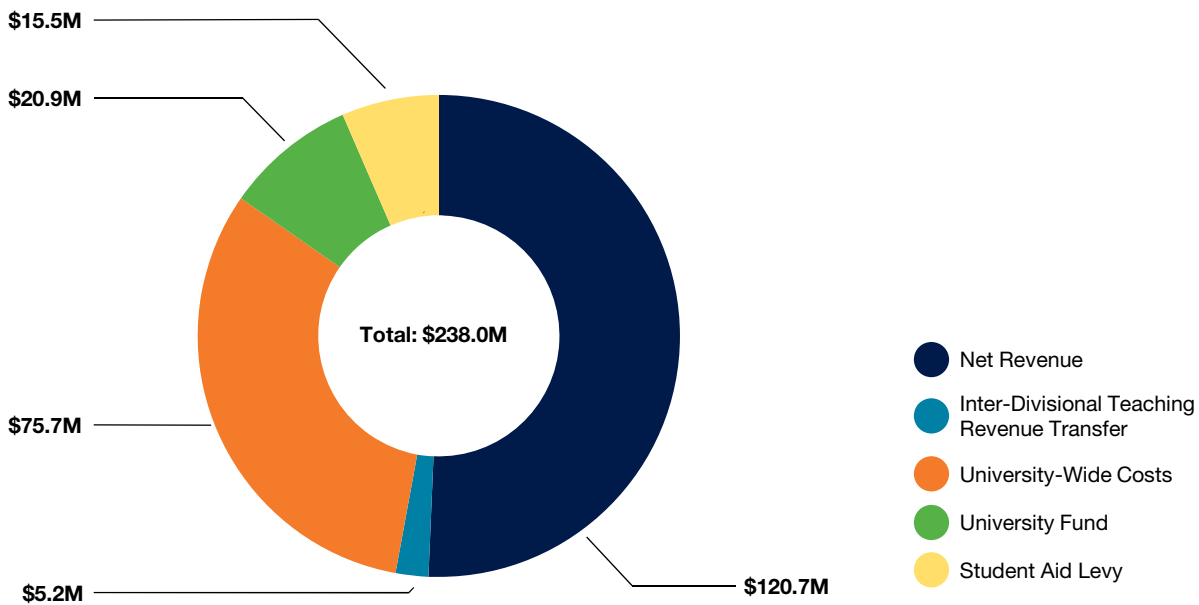
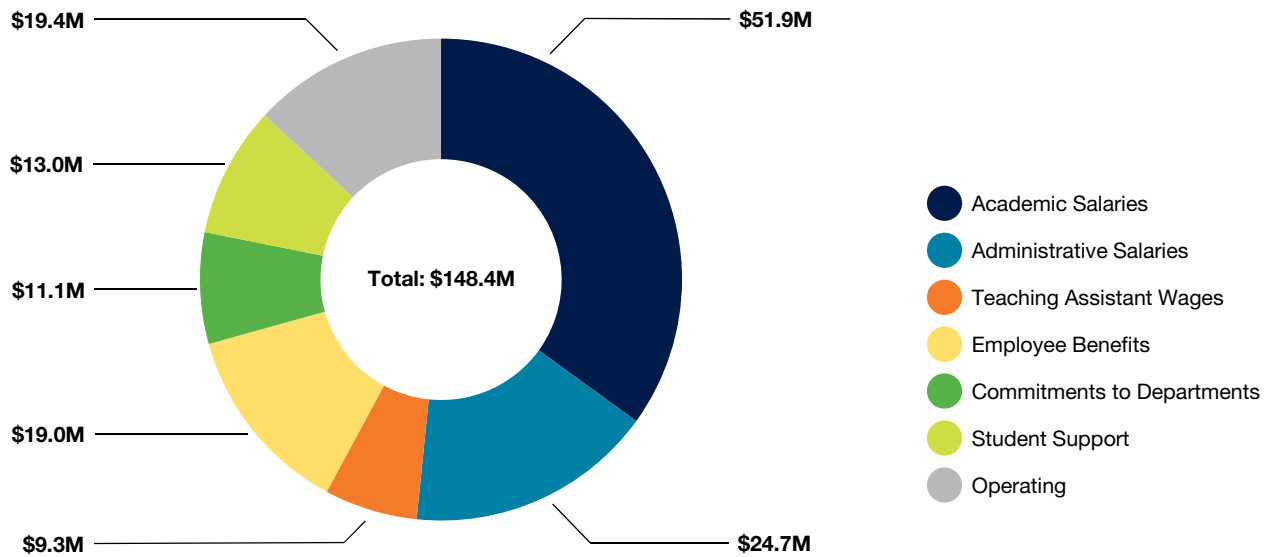


Figure 11.6 Total Operating Budget: Breakdown by Expense, 2018–2019 (net of central university costs)



Dean’s Strategic Fund

The Dean’s Strategic Fund (DSF) was created in 2010 to provide seed funding for projects and initiatives with broad impact within the Faculty. Over the past nine years, we have supported more than 130 projects with a collective total funding of more than \$47 million.

In 2018–2019, we received a large number of submissions. Both the number of projects and the amount of funding were our highest single-year totals to date, at 34 projects and \$11.4 million, respectively. Shown in Figure 11.7 below, the projects cover a wide range of areas, from the revitalization of machine shops for student clubs and teams to new laboratory equipment and research facilities.

Figure 11.7 Dean’s Strategic Fund Projects, 2018–2019

Project	Primary Unit
The Engineering Entrepreneurship Hatchery - Forming Student, Faculty and Alumni Entrepreneurs	Faculty Level
Machine Shop Access for All Engineering Students	MIE
LEAP: UofT Engineering Outreach in Labrador	MSE
Engineering Campus Experience Officer (CEO) Pilot Program	Vice-Dean, Undergraduate
U of T Engineering Leadership to Inspire Further Education (U of T Eng LIFE)	Engineering Outreach
Lassonde Institute: Global Mining Initiatives	CivMin, MSE
Unleashing the Power of Student-Data Analytics: A Pilot Project to Track and Assess Student Experience and Competency Development	ISTEP
Research and project execution skills for graduate research students	ChemE
Development of Online MEng Courses in Mineral Engineering	CivMin

Project	Primary Unit
Smart Freight Centre (SFC): A Centre of Excellence in Goods Movement	CivMin
WB25/125 Fumehood Exhaust Ventilation	ChemE
Blue Sky Solar Workshop Renovation (EA104)	ECE
Special Opportunity on Micro-Electrical Mechanical Systems (MEMS) Fabrication Equipment Acquisition for The Toronto Nanofabrication Centre (TNFC)	ECE
Supporting effective provisioning of social services with the Social Needs Marketplace	MIE
Urban Water, Waste and Energy Solutions: A Global Research Alliance with National University of Singapore	Faculty Level
Establishment of “Low Carbon Renewable Materials Centre” at the Faculty of Applied Science and Engineering	ChemE, MIE
Campus Magnetic Resonance Imaging Facility (CMRIF)	IBBME
Centre for Urban Mining Innovations	ChemE
Understanding the Experiences of Female Engineering Students: From Recruitment to Retention, Influence & Belonging	Troost ILead
Sustainable Peri-Urbanization (SPUr) Initiative	CGEN
Towards U of T Centre on 2D Materials, with Application to Infrastructure, Aerospace, Transportation, and Energy Technologies	MIE
Cross-department pre-tenure faculty retreat	ChemE
Towards Quieter Green Aviation Technology	UTIAS
BioZone: Enhancing Partnerships, Impact, and Training	BioZone
Infrastructure for Genomic Engineering Research	IBBME
Additive Manufacturing Work Cell	MIE
Enabling Multi-Disciplinary Electric Vehicle Research on the St. George Campus: Tackling EV Accessibility in Engineering Annex	ECE
A Centre of Excellence for Anaerobic Digestion	ChemE
Seeking to understand and evaluate to what extent we teach, or should teach, “Integrated Risk Management” in engineering education	CivMin
From the Macro to the Micro: Leveraging Macroscale Robotics Algorithms for Microscale Systems	UTIAS
Enhancing FASE Engineering Education Scholarship and Research Activity	ISTEP
CEM (Clean Energy Materials - Toronto-Mexico)	ChemE
The Centre for Quantum Information and Quantum Control	ECE
WSeed: Strengthening cohesion and impact through cross-departmental collaboration	Institute for Water Innovation (IWI)

In addition to these, many other projects supported by past commitments through the DSF continue to operate. One of these is XSeed, which stimulates and expands opportunities for research collaboration between U of T Engineering and other divisions of the University of Toronto, including UTM, UTSC, OISE and the Faculties of Arts & Science and Kinesiology & Physical Education. *(For more information on XSeed and the related EMHSeed program, see Chapter 3 – Research under “Catalyzing Multidisciplinary Collaboration”)*

Infrastructure and Facilities

Our Engineering Precinct encompasses 19 buildings across U of T's St. George campus and north of the campus at Downsview, from modern structures such as the Myhal Centre for Engineering Innovation & Entrepreneurship, to buildings of historical significance such as the Sandford Fleming Building and Lassonde Mining Building, both of which date back more than a century. (*Appendix I provides a map of the Engineering Precinct.*) Each of these contain unique research and educational spaces that are critical to our position as the top-ranked engineering school in Canada and among the best in the world.

Figure 11.8 Summary of Buildings and Areas Occupied by the Faculty of Applied Science & Engineering, 2018–2019

Code	Building	Office of the Dean	EngSci	UTIAS	ChemE	CivE & MinE	ECE	IBBME	MIE	MSE	Total NASMs
AS	Aerospace (Downsview)			5,293							5,293
BA	Bahen Centre	1,351	561		67		5,744		1,388		9,111
DC	Donnelly CCBR				667			889			1,556
ES	Earth Sciences				164						164
EA	Engineering Annex	328					936				1,264
EL	Electrometal									149	149
FI	Fields Institute	325									325
GB	Galbraith	1,667				5,042	4,143				10,852
HA	Haultain				198	110			646	721	1,675
	MaRS West Tower						136	791	183		1,110
MB	Lassonde Mining					1,205		1,362	1,891	831	5,289
MC	Mechanical Engineering	63							5,398		5,461
MY	Myhal Centre	4,860									4,860
PT	D.L. Pratt						1,327			1,488	2,815
RS	Rosebrugh							818	2,096		2,914
SF	Sandford Fleming	766		692		1,558	3,547				6,563
WB	Wallberg	375			8,275		130			1,381	10,161
RM	256 McCaul	528									528
	704 Spadina	240									240
	Total Area	10,503	561	5,985	9,371	7,915	15,963	3,860	11,602	4,570	70,330
		70,330 NASMs (Net Assignable Square Metre)									

Current Projects



Myhal Centre for Engineering Innovation & Entrepreneurship

The Faculty's newest building lies at the heart of our vibrant community. We hosted the official opening of the Myhal Centre in April 2018, with dedication ceremonies for the named spaces within the building taking place throughout the summer and fall of 2018. In September 2018, the MY Open House event enabled faculty, staff, students, alumni and friends to engage with the state-of-the-art facilities and learning spaces, as well as its multidisciplinary institutes and centres. In May 2019, U of T Engineering participated in two city-wide events that invited the general public to explore the Myhal Centre: the month-long Scotiabank CONTACT Photography Festival and Doors Open Toronto on May 25 and 26. Both events welcomed visitors to learn about our Faculty's rich history and how we are shaping the future through innovations in engineering research and education. *(For more information on these initiatives, see Chapter 8 – Communications.)*

All occupants — including staff in Engineering Advancement, the Troost Institute for Leadership Education in Engineering, the University of Toronto Institute for Multidisciplinary Design & Innovation and many other centres and institutes — are fully established in their new spaces. Classes have been taking place in the building since September 2018, and the Fabrication Facility on Level 4 is now fully staffed and operational Monday through Friday, as well as on Sundays. The Myhal Centre is being well used by students, faculty, staff, alumni and external partners, with many events being held in the public spaces along with visits by other universities.

Wallberg Building Rooftop Expansion for the Sustainability Lab

This ChemE project will create a multidisciplinary lab focusing on energy capture, storage, conversion and integration on the roof of the Wallberg Building. We have retained the services of an architect and the detailed design is under review. We are currently focusing on securing full funding, with a target start date set for the end of 2019 and completion in 2020.

Galbraith Building West Side Landscaping

We are renewing and improving this public space amenity and community-building area along the west side of the Galbraith Building, facing St. George Street. Included within the scope of this project is the refurbishment and repositioning of "Becca's H," a sculpture by Robert Murray celebrating the Faculty's 1973 centennial. The project will also improve accessibility into the Galbraith Building's lobby from the street. The project is expected to be complete by September 2019.

Galbraith Building All-gender Washroom Conversion & Renovations

To enhance inclusivity, we are converting two washrooms on the first floor of the Galbraith Building into one large, modern and accessible all-gender, multi-stall washroom. An architect has been retained to begin the design for this project, which will require coordination with other capital projects being undertaken this year in and around the Galbraith Building. Construction is expected to begin in May 2020.

New Bunkhouse at Gull Lake Survey Camp

We are repairing, renovating and expanding the site of Civil and Mineral Practicals (CAMP) on Gull Lake, which will celebrate its centenary in 2020. The project includes the construction of a new bunkhouse and a washroom and shower facility, along with common space for undergraduate students. An architect has been retained and schematic design revisions are underway. Construction is expected to be complete for use in the summer of 2021.

Transformation of the Engineering & Computer Science Library Spaces

For several years, we have been engaged in a transformation of our library space on the second floor of the Sandford Fleming Building to enhance innovative learning activities. In 2016 we created space for more individual study carrels and enhanced the overhead lighting in the main area. Going forward, the library's two floors will be renovated, with the mezzanines removed and upgrades to HVAC, electrical facilities and audiovisual equipment. An architect has been selected and the master plan has been completed, with construction anticipated to start in December 2019. This project is supported jointly by U of T Engineering, the University of Toronto Libraries and U of T Facilities & Services.

Mechanical Engineering Building Lobby Renovations

To improve the student experience, we have renovated the lobby of the Mechanical Engineering Building, making it larger and improving access to the auditorium. The project included enhanced accessibility features as well as new flooring, lighting and seating. The project was substantively completed in the fall of 2018, and the installation of the remaining component, an outdoor snow and ice melt system, began in spring 2019 and is expected to be complete by the summer.

Gas Turbine Combustion Research Lab at the University of Toronto Institute for Aerospace Studies

In 2014, we began construction of this unique facility at UTIAS, which uses lasers and a pressurized combustion chamber to enable advanced analysis of the gases and fuels used in aircrafts and power generation plants. This research informs the design of next-generation turbines that could

improve efficiency or be adapted to run on renewable fuels, all without compromising performance or safety. The construction of this multi-year project is expected to be complete this summer.

Laboratory Upgrades to Wallberg 232

This facility is supported by a Canada Foundation for Innovation grant received by Professor Nikolai DeMartini (ChemE). The exhaust ventilation improvements will enable further expansion of his research into recovery of "black liquor" waste products from pulp and paper plant processes, thereby enhancing their efficiency. Construction began in April 2019 and is expected to be complete this summer.

Laboratory Redevelopment – Rosebrugh Building

The Institute of Biomaterials & Biomedical Engineering is embarking on a program to redesign the lab and office spaces in the Lassonde Mining Building and the Rosebrugh Building. The first group of spaces to be redeveloped are RS422, RS404, and RS420; with the University's Design & Engineering staff completing the schematic design of the latter two in anticipation of their construction being complete for the summer of 2020. Concurrently, the Department of Mechanical & Industrial Engineering is also undertaking the renovation of RS104A with the schematic now nearing completion.

