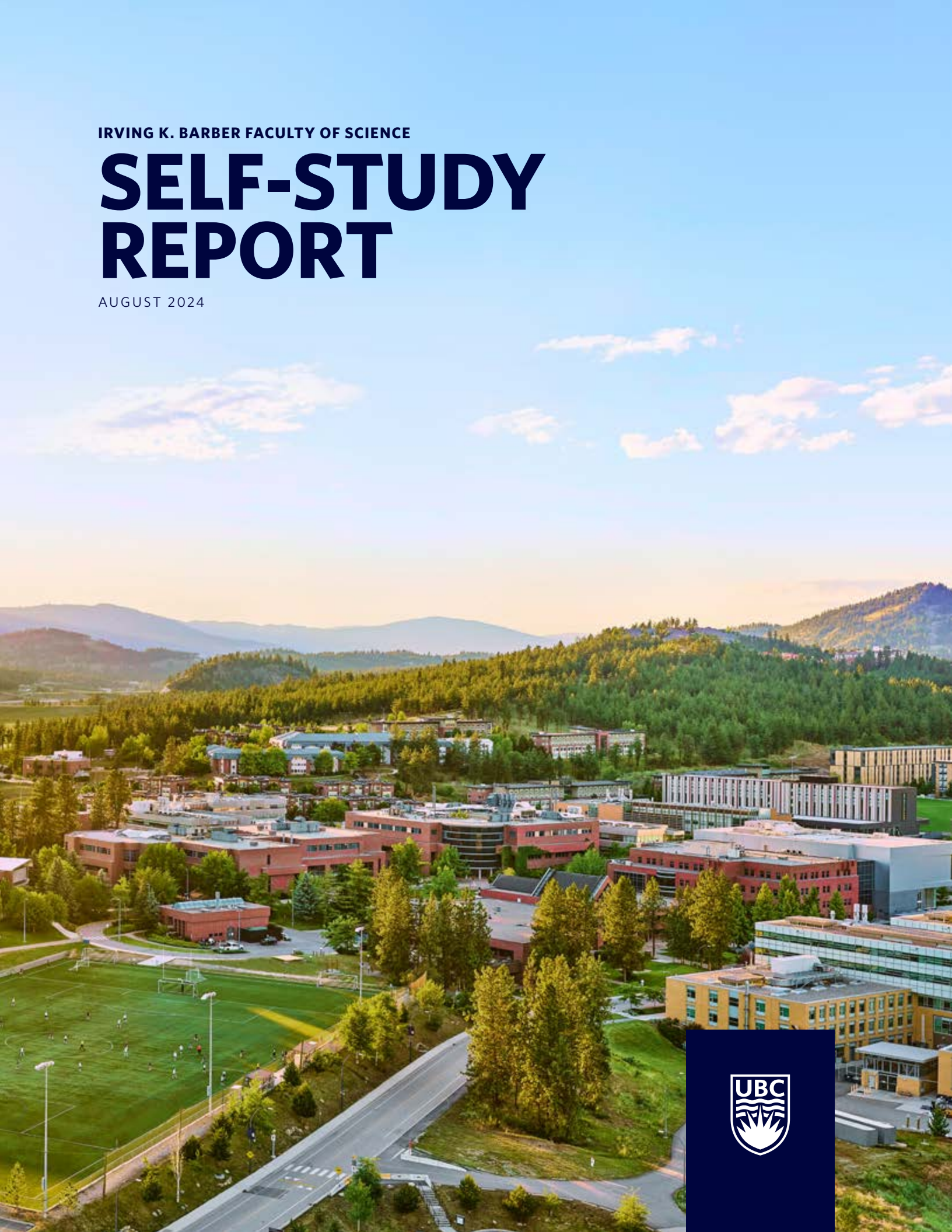
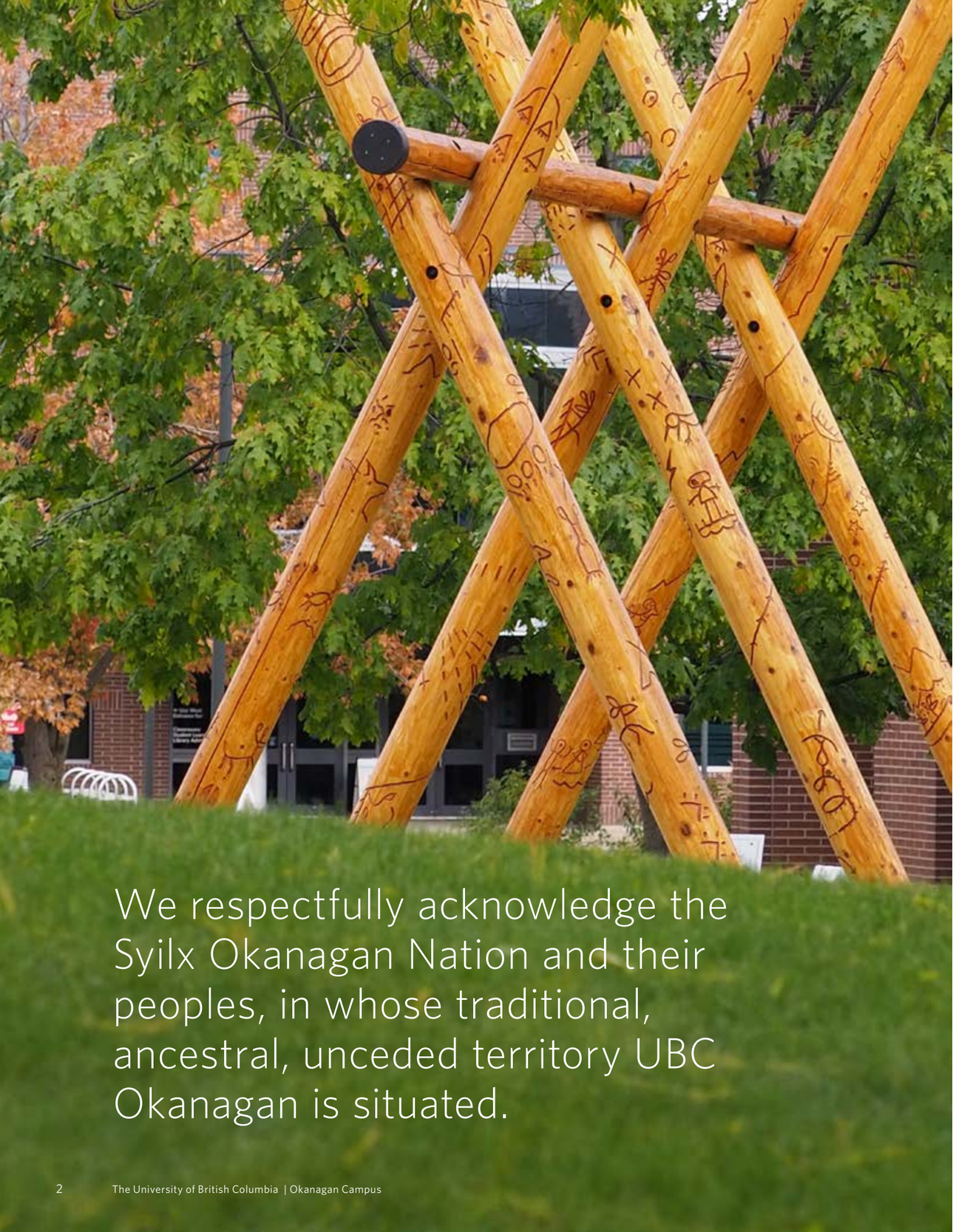
IRVING K. BARBER FACULTY OF SCIENCE

SELF-STUDY REPORT

AUGUST 2024





We respectfully acknowledge the Syilx Okanagan Nation and their peoples, in whose traditional, ancestral, unceded territory UBC Okanagan is situated.

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INTRODUCTION

1.1

Irving K. Barber Faculty of Science At a Glance

QUICK FACTS

3,026 UNDERGRADUATE STUDENTS

357 GRADUATE STUDENTS

110 FACULTY

50 STAFF

4 DEPARTMENTS

9 CENTRES & INSTITUTES

$9.95 M IN RESEARCH FUNDING

2023/24

1.2

Overview

The Irving K. Barber Faculty of Science (IKBFoS) is the largest Faculty on UBC's Okanagan Campus, though it remains intimate in the context of the UBC system.

Formerly a part of the Irving K. Barber School of Arts and Sciences (IKBSAS), the IKBFoS was created when the School transitioned to two autonomous Faculties on July 1, 2020.

Our Faculty bears the name of the late Dr. Irving K. Barber, a highly-respected forester, entrepreneur and philanthropist. Dr. Barber wanted to fund projects that would strengthen British Columbia, and improve the quality of life for its residents.

He looked to UBC's new Okanagan Campus to realize this vision.

In 2004, he provided a generous gift that resulted in the 2005 founding of IKBSAS, as well as the IKBSAS Endowment Fund. The school's founding principles included commitments to excellence in research, teaching and learning, experiential learning, and community engagement. The IKBFoS continues to embody this excellence nineteen years later.

The IKBFoS is home to 110 faculty, and 50 staff members who work diligently to ensure our 3,400 students receive the best instruction, training, support and research opportunities available—all within a close-knit learning community.

Our activities in research, educational leadership and undergraduate and graduate programming broadly span three core academic pillars: *Sustainability & Climate Resilience, Life Sciences for Agriculture & Health* and *Computational & Data-Intensive Sciences*. As described in the pages that follow, these inter-related pillars represent our current academic strengths and aspirations for future development. Through our work in these pillars, we remain committed to inclusion and place-based learning by working closely with local First Nations, public and private sector partners, and others in academia to find solutions to societal issues, and to advance knowledge in areas like wildfire mitigation, sustainable agriculture development, emerging cancer research and artificial intelligence literacy. We look forward to strengthening and building on these partnerships to ensure that our research and teaching activities continue to have a meaningful impact on our local and global communities.

The UBC Okanagan Campus has experienced significant growth since its inception—conferring over 26,000 degrees since 2005, and reaching $45 million in academic research funding in 2023/2024. The IKBFoS has played an integral role in this growth, securing over $9.95 million in research funding in 2023/2024, up from $6.36 million in science-specific research funding in 2018/2019. Our Faculty has experienced a 20% increase in undergraduate student enrollment, and a 90% increase in graduate student numbers over the same time period. Compiling this self-study document has provided us the opportunity to pause and reflect on who we are, who we want to be and how much additional growth can be accommodated. We have identified our strengths, celebrated our successes, and contemplated the direction in which our Faculty should travel—all in the context of shifting geo-political climates, a post-pandemic world, and increasing climate change uncertainty.

As the University of British Columbia undergoes a refresh of its institutional strategic plan, it is evident that the landscape of post-secondary education delivery is ever-changing.

In the IKBFoS, we embrace change. It was change that led to the creation of our Faculty in 2020, resulting in improved opportunities for science students, faculty and staff. We also recognize that not everything requires change.

We feel as passionate about our founding principles now, as we did in 2005, and we remain committed to excellence in research, teaching and learning, experiential learning and community engagement.

Note on data used in this document:
For the purpose of illustrating trends since the last external review of the former Irving K. Barber School of Arts and Sciences, and to reference pre- and post-COVID-19 conditions, we provide data going back to the 2018/19 year for science programs and departments. Note that 2020/2021 is the first complete academic year for which we have IKBFoS specific data.

Academic Pillars 1.3

1.3 Academic Pillars

	PILLAR 1 SUSTAINABILITY & CLIMATE RESILIENCE	PILLAR 2 LIFE SCIENCES FOR AGRICULTURE & HEALTH	PILLAR 3 COMPUTATIONAL & DATA-INTENSIVE SCIENCES
Academic Programs	**Undergraduate programs:** **Bachelor of Science (BSc)** • Earth & Environmental Sciences • Ecology, Evolution & Conservation Biology • Environmental Chemistry • Freshwater Science • General Studies • Geospatial Information Science • Zoology **Bachelor of Sustainability (BSust)** • Environmental Analytics • Environmental Conservation & Management • Green Chemistry **Graduate programs:** • Biology • Chemistry • Earth and Environmental Sciences • Sustainability (IGS) • Urban and Regional Studies (IGS) **Professional programs:** • Wetland Delineation & Assessment (micro-credential) • Fundamentals of Wildland Fire Ecology & Management (micro-credential) • Critical Skills for Communications in the Technical Sector (micro-credential)	**Undergraduate programs:** **Bachelor of Science (BSc)** • Biochemistry & Molecular Biology • Biology • Chemistry • Environmental Chemistry • General Studies • Microbiology • Physics • Zoology **Bachelor of Sustainability (BSust)** • Green Chemistry **Graduate programs:** • Biochemistry & Molecular Biology • Biology • Chemistry • Medical Physics **Professional programs:** • Critical Skills for Communications in the Technical Sector (micro-credential) • Metabolomics (micro-credential) • Master of Biotechnology (pending final Ministry approval)	**Undergraduate programs:** **Bachelor of Science (BSc)** • Combined Physics & Mathematics • Computer Science • Data Science • General Studies • Geospatial Information Science • Mathematics • Physics • Statistics **Bachelor of Sustainability (BSust)** • Environmental Analytics **Graduate programs:** • Computer Science • Mathematics • Medical Physics **Professional programs:** • Critical Skills for Communications in the Technical Sector (micro-credential) • Metabolomics (micro-credential) • Master of Data Science
Research Centres, Institutes, and Clusters	• Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) • Centre for Wildfire Coexistence • Wine Research Centre • Centre for Environmental Assessment Research (CEAR) • Centre for Climate Resilience Research • Fipke Laboratory for Trace Element Research (FiLTER) • Solar Energy for Net Zero (Eminence cluster) • Indigenous-led Impact Assessment (Eminence cluster) • Living with wildfire in the BC Southern Interior (Eminence cluster) • Future research hubs in x̌əl sic snpax̌nwix̌ʷtn: BRAES; Watershed Ecosystem Centre; Sustainability Core Faculty, Intelligent Analytics	• Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) • Wine Research Centre • Personalized Cancer Radiotherapy (Eminence cluster) • Immunobiology (Eminence cluster) • Future research hubs in x̌əl sic snpax̌nwix̌ʷtn: Centre for Integrative Bioscience • Institute for Analytics in Medical Sciences	• Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) • Institute for Analytics in Medical Sciences • Centre for Optimization, Convex Analysis and Non-smooth Analysis (COCANA) • Banff International Research Station for Mathematical Innovation and Discovery (BIRS) • Data safety & AI literacy (Eminence cluster) • Future research hubs in x̌əl sic snpax̌nwix̌ʷtn: Intelligent Analytics
Major Research & Education Partners	• Biodiversity Pathways • Forest Renewal BC • Egg Farmers of Canada • Rogers Communications • Agriculture & Agri-Food Canada • National Research Council • Pacific Institute for Climate Solutions • Okanagan Nation Alliance • West Moberly First Nations • Saulteau First Nations	• Agriculture & Agri-Food Canada • National Research Council • BC Cancer	• National Research Council, including the Dominion Radio Astrophysical Observatory (DRAO) • Honda Research Institute – Japan • Pacific Institute for the Mathematical Sciences (PIMS)
Other Major Research Initiatives	• UBC's Climate Solutions Research Collaborative • Interior University Research Coalition (IURC) • OER Research and Implementation	• OER Research and Implementation	• Canadian Hydrogen Intensity Mapping Experiment (CHIME) • Interior University Research Coalition (IURC) • OER Research and Implementation
Featured Individual Research Programs	• CRC (tier 2) in Wildlife Restoration Ecology • UBCO PRC (tier 1) in Tectonics • UBCO PRC (tier 2) in Nanogeology • NSERC/Egg Farmers of Canada IRC in Sustainability • Endowed Chair in Watershed Science (Watershed Enhancement Fund) • UBCO PRC (tier 2) in Natural Products Biotechnology (proposed) • UBCO PRC (tier 2) in Wildfire Resilience (proposed) • Grant-tenure Research Faculty in Wildlife Management & Conservation (with Biodiversity Pathways) • CRC Tier 2 in Climate Resilience & Water Resources (forthcoming)	• CRC (tier 2) in Single-molecule Biophysics and Mechanobiology • 4 x Michael Smith Health Research BC fellows • UBCO PRC (tier 1) in Computational Chemistry • UBCO PRC (tier 2) in Natural Products Biotechnology (proposed)	• UBCO PRC (tier 1) in Ubiquitous Analytics • UBCO PRC (tier 1) in Computational Chemistry • CRC (tier 2) in Human-Centred Explainable Analytics (forthcoming)
Spinoff/Commercialization		Melius MicroBiomics Inc. (2023–present)	
Featured International Collaborations	• US-Canada Centre on Climate-Resilient Western Interconnected Grid • Germany-Canada's Sustainable Processes & Chemistry collaborations	• NSERC-DFG Germany-Canada's Sustainable Processes & Chemistry collaborations	• US-Canada Centre on Climate-Resilient Western Interconnected Grid • Honda Research Institute – Japan • Square Kilometre Array (SKA) project

Academic Pillars are numbered for reference purposes only and are not indicative of priority.

2.0

ACADEMICS

2.1

Undergraduate Education and Student Learning

The IKBFoS offers discipline-based and interdisciplinary undergraduate degrees in the sciences and sustainability.

The close-knit learning environment is both flexible and student-focused with research fully integrated into the student experience.

UNDERGRADUATE QUICK FACTS

3,026 UNDERGRADUATE STUDENTS

23 UNDERGRADUATE PROGRAMS

19 BSC

4 BSUST

51% FEMALE

47% MALE

<1% NON-BINARY

<2% UNDISCLOSED

22% INTERNATIONAL

78% DOMESTIC

123+ INDIGENOUS STUDENTS

2023/24

ACADEMIC PROGRAMS

The IKBFoS offers two degrees, the Bachelor of Science (BSc) and the Bachelor of Sustainability (BSust).

Bachelor of Science Programs

Biochemistry and Molecular Biology	Major, Honours
Biology	Major, Honours, Minor
Chemistry	Major, Honours, Minor
Combined Physics and Math	Major, Honours
Computer Science	Major, Honours, Minor, also offered as a BA
Data Science	Major, Honours, Minor
Earth and Environmental Sciences	Major, Honours, Minor
Ecology, Evolution, and Conservation Biology	Major, Honours
Economics (housed in IKBFASS)	Major, Honours, Minor
Environmental Chemistry	Major, Honours
Freshwater Science	Major, Honours
General Studies	Allows concentrations in two or three disciplines
Geospatial Information Science	Minor
Mathematics	Major, Honours, Minor, also offered as a BA
Microbiology	Major, Honours
Physics	Major, Honours, Minor
Psychology (housed in IKBFASS)	Major, Honours, Minor
Statistics	Major, Honours, Minor
Zoology	Major, Honours

The IKBFoS oversees all students in the BSc degree, including students who major in a discipline in another Faculty (i.e. economics and psychology); conversely, the IKBFoS does not oversee those students in the BA degree who major in a discipline in the IKBFoS (i.e. computer science and mathematics).

Bachelor of Sustainability Concentrations (equivalent to a major)

Environmental Analytics	Housed in IKBFoS (CMPS Department)
Environmental Conservation & Management	Housed in IKBFoS (EEGS Department)
Environmental Humanities	Housed in FCCS
Green Chemistry	Housed in IKBFoS (CHEM Department)

BSc students can also complete a double major in two disciplines, including select programs offered by the Irving K. Barber Faculty of Arts and Social Sciences (IKBFASS) and the Faculty of Creative and Critical Studies (FCCS). BSc students can also complete minors in select disciplines offered by IKBFASS, FCCS, and the Faculty of Management (FoM). Students may also elect to enroll in the dual degree Master of Management.

DEGREE AND PROGRAM LEARNING OUTCOMES

The BSc Degree Learning Outcomes:

Depth and Breadth of Knowledge

Demonstrate competence in a scientific discipline including: key concepts, assumptions, methodologies, quantitative and qualitative techniques, computational methods, Indigenous approaches, interdisciplinary linkages, and the limits of knowledge.

Application of Knowledge

Demonstrate the capacity to use current knowledge and techniques to evaluate problems, propose methods of solution, conduct analyses, evaluate and interpret results, make conclusions, and make recommendations.
Question and evaluate information and interpretations,and consider alternate perspectives, including Indigenous ways of knowing.

Generation of Knowledge

Demonstrate the skills necessary to engage in the research process and use scholarship relevant to the discipline.

Communication

Demonstrate the ability to discuss and disseminate scientific information, to specialist and non-specialist audiences, using oral, visual, and written communication, based on logical, structured, and coherent arguments.

Professional Conduct

Demonstrate the qualities and skills necessary for employment, community involvement, and other activities including: initiative, transparency, and accountability in both personal and group contexts; work effectively with others; and demonstrate ethical behavior.

The BSust Degree Learning Outcomes:

Sustainability Knowledge:

- Examine, appraise, and propose solutions to contemporary sustainability issues.
- Describe and employ sustainability models and paradigms related to their area of concentration.
- Apply their knowledge of the challenges associated with sustainability to shape and inform policy, planning, management, and social, cultural, and institutional change.

Awareness and Integration:

- Integrate information from multiple disciplines with awareness of personal impacts, behavioural patterns, and processes of constructing knowledge.
- Promote the argument that sustainability demands and requires participation and knowledge from all disciplines and sectors of society.
- Design and conduct research in an area of sustainability practice both independently and collaboratively.

Acting for Positive Change:

- Use communication tools effectively to engage others in reflection, critical thought, and positive and effective action.
- Discuss and debate various perspectives on sustainability with diverse stakeholders.
- Formulate, propose, and realize the positive changes needed to sustain natural and social systems in collaboration with others.

Holistic Systems Thinking:

- Describe and analyze the interconnectedness and interdependency of social, ecological, and economic systems from local to global scales.
- Examine complex sustainability concerns from a holistic, systems perspective that integrates concepts from the arts, humanities, and applied social and natural sciences.

The IKBFoS has set a target of having program learning outcomes (PLOs) articulated and assessment plans in place by 2027. As of August 2024, we have PLOs articulated for four of our programs and we are on track to meet our goal.

UNDERGRADUATE HEADCOUNT

Number of Students Registered in IKBFoS Undergraduate Degree Programs (2018 – 2023)

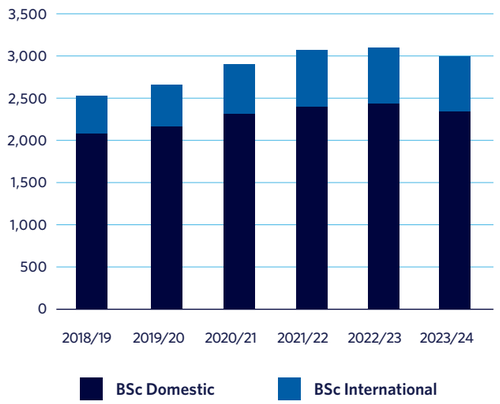
Degree	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
BSC	2,535	2,668	2,934	3,102	3,089	2,979
BSUST	-	-	-	-	27	47
Total	**2,535**	**2,668**	**2,934**	**3,102**	**3,116**	**3,026**

IKBFoS undergraduate enrollment has increased by approximately 20% from 2018 to 2024. Significant growth was observed over the COVID-19 pandemic when courses were shifted online. This growth stabilized in 2022 and decreased slightly in 2023. We have adjusted to this growth by increasing our faculty numbers (see Financial Planning and Resources below), resulting in an improved student-to-faculty ratio of 24.6 in 2023/24 compared to 26.8 in 2020/21.

The University and the IKBFoS are committed to attracting, retaining, and supporting Indigenous students. The Access Studies Program prepares and transitions Indigenous learners into degree programs at UBC Okanagan. Students can register in up to 24 credits without the need to be associated with a degree program. In 2023, Indigenous students represented 5% of the IKBFoS domestic student population *(Appendix A, Number of Indigenous versus Non-Indigenous Students Registered in IKBFoS Undergraduate and Graduate Degree Programs (2018 – 2023)).*

International student enrollment grew between 2018 and 2021 and has now stabilized. In 2023, the top four home countries of IKBFoS international students were India (21%), China (16%), United States (4%), and Indonesia (4%).

Domestic versus International Students Registered in Science Undergraduate Degree Programs (2018 – 2023)



The time to completion for IKBFoS undergraduate students averages under five years.
Two years after graduation, our BSc students largely report employment within their field of training.
(See Appendix B, Post-graduation Occupations for Graduates)

526 undergraduate degrees, 64 Master's degrees and 8 PhD degrees were conferred in 2024.
(See Appendix C, Undergraduate Degrees Conferred by the IKBFoS by Discipline (2018 – 2023) and Appendix D, Graduate Degrees Conferred by the IKBFoS by Discipline (2018 – 2023))

ENROLLMENT BY PROGRAM

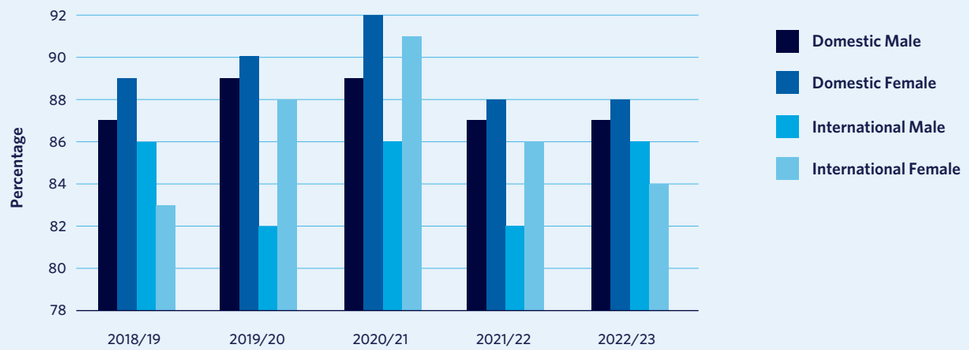
Number of Students Enrolled in IKBFoS Undergraduate Programs (2018 – 2023)

Primary Field of Study	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Biochemistry	300	309	346	304	312	319
Biology	259	263	272	284	296	255
Chemistry	82	90	94	87	82	76
Computer Science	260	318	390	450	517	557
Data Science	19	32	45	48	59	67
Earth & Environmental Sciences	138	133	120	123	115	123
Ecology Evolution & Conservation Biology	13	24	31	34	45	56
Economics	33	27	23	26	26	30
Environmental Chemistry	23	23	28	27	26	21
Freshwater Science	14	16	12	8	7	6
General Program	39	50	47	44	33	40
Mathematics	78	92	79	66	68	54
Microbiology	124	116	104	119	125	112
Physics	87	90	89	73	65	57
Psychology	176	182	211	255	314	315
Statistics	3	6	8	15	14	20
Zoology	69	83	101	101	89	79
BSust: Environmental Analytics	-	-	-	-	4	5
BSust: Environmental Conservation & Management	-	-	-	-	20	35
BSust: Green Chemistry	-	-	-	-	3	7

UNDERGRADUATE RETENTION

Retention of domestic students is typically higher and more stable than international students.

BSc Student Retention (2018 – 2023)

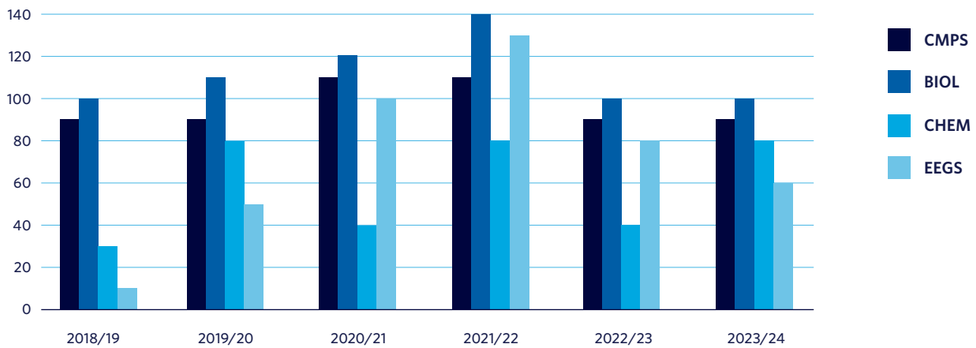


The majority of students who leave the BSc do so to pursue a BSc on the Vancouver campus (40%) or a BA in IKBFASS (20%).

CLASS SIZE & SECTION COUNT

Most first-year classes are large, with enrollments of up to 400, particularly in Chemistry and Biology. In response, first-year Chemistry has been carefully re-designed with multiple active-learning, guided inquiry activities (supporting the highly context-embedded curriculum), resulting in a +23% increase in student success rates between 2014 and 2019. In contrast, first-year math courses have moved to smaller class sizes and an increased number of sections to improve the student learning experience. The largest class sizes are in first- and second-year, and classes are smaller in upper-level courses. The IKBFoS average class size is stable at around 80 seats, and the number of sections offered per year is stable at around 280.

Number of Course Sections Taught by Department (2018 – 2024)



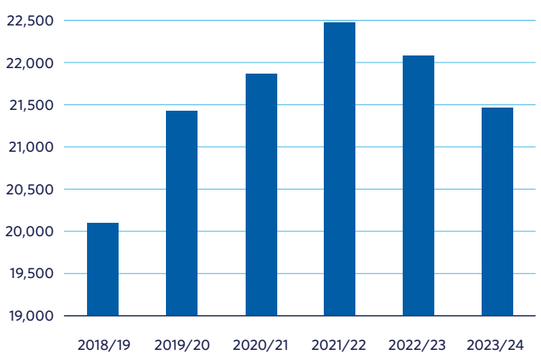
ENROLLMENT

Enrollment peaked in the 2021/22 academic year, driven by the increased accessibility of online courses during the pandemic.

While the IKBFoS primarily serves students completing a BSc or BSust degree, it also provides courses for students in other degrees. Of all students enrolled in IKBFoS undergraduate courses, 79% are BSc students, 12% are BA students, 4% are BMgt students, and the remaining 5% include: applied science students (BASc), nursing students (BSN), and human kinetics students (BHK).

Total Enrollment in IKBFoS Undergraduate Courses (2018 – 2024)

Includes students enrolled in degrees other than the BSc.



2.2

Graduate Education and Post-Doctoral Training

Our graduate programs collectively embody our core values of excellence, diversity, integrity, and inclusion. Our work is infused with a collaborative spirit that is evidenced in our community engagement.

The first Graduate Programs (GPs) offered in the IKBSAS in 2005 were in Environmental Sciences and Interdisciplinary Graduate Studies (IGS). Since then, IKBFoS has grown to encompass eight GPs all offering MSc and PhD programs. Until 2023, all graduate programs were run individually, with a Program Coordinator (PC) assigned to a given graduate program by relevant department heads. There was little coordination among GPs, and each program liaised with the College of Graduate Studies (CoGS). Faculty-wide components were handled through the Associate Dean – Research (graduate student funding) and the Associate Dean – Academic and Awards portfolios (graduate awards). This governance model became unsustainable as the GPs grew in number and scope, and in 2023, two new positions were created within the Dean's Office: the Associate Dean of Graduate and Postdoctoral Studies (AD-GPS), and the Manager of Graduate and Postdoctoral Studies, who reports to the Associate Dean. Post-doctoral fellows (PDF) are often overlooked administratively speaking, as they are not within the graduate portfolio, nor are they staff or faculty. To address this omission, PDF were specifically stated as being part of the portfolio when the AD-GPS position was created.

GRADUATE QUICK FACTS

357 GRADUATE STUDENTS

237 MSC | **120** PHD

24 POST-DOC FELLOWS

8 GRADUATE PROGRAMS

- Biochemistry and Molecular Biology
- Biology
- Chemistry
- Computer Science
- Earth and Environmental Sciences
- Mathematics
- Medical Physics
- Interdisciplinary Graduate Studies (IGS)

43% FEMALE

41% MALE

16% UNDISCLOSED

57% INTERNATIONAL

43% DOMESTIC

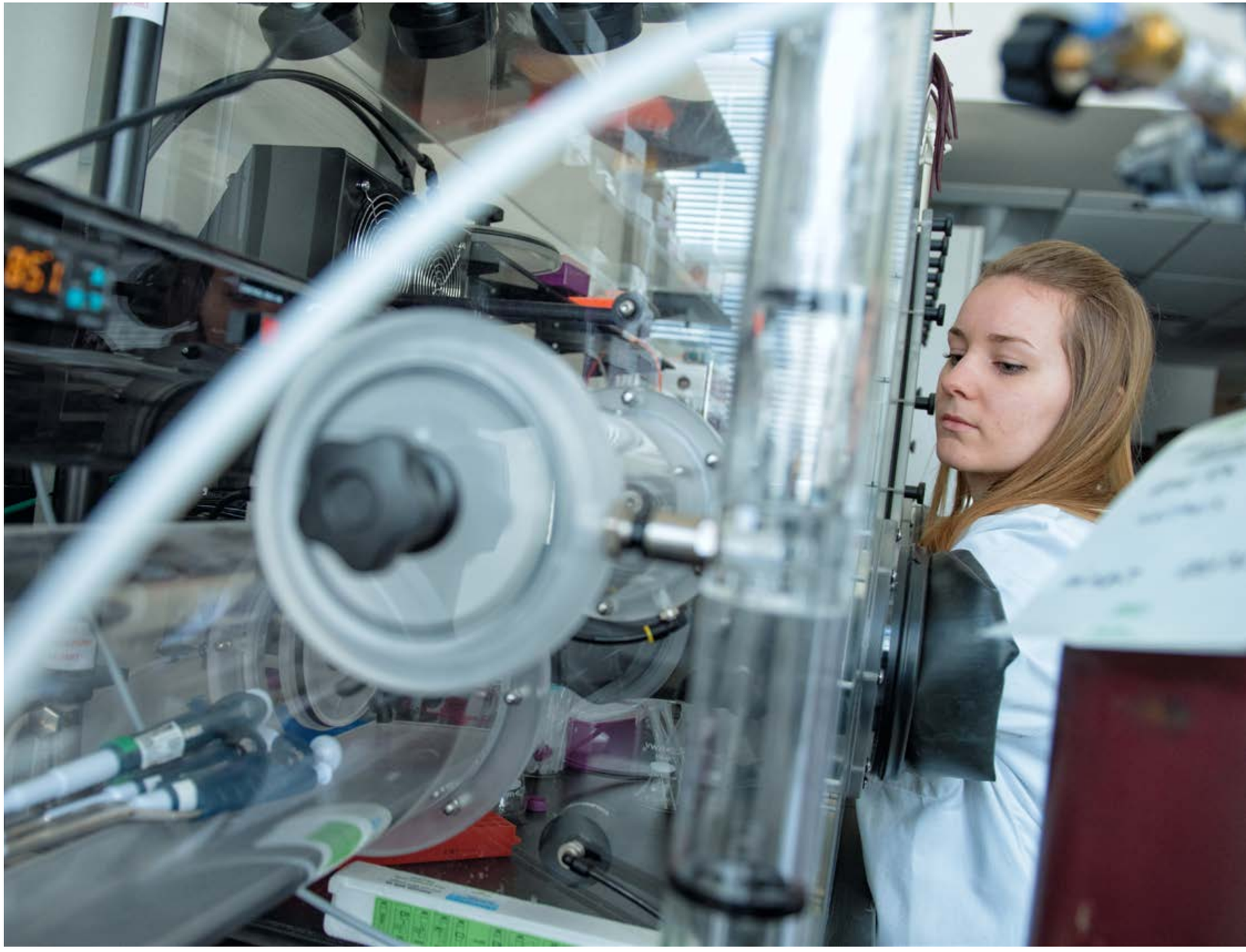
22 EXTERNAL AWARD HOLDERS

2023/2024

Graduate Education and Post-Doctoral Training 2.2

POST-DOCTORAL FELLOWS

Our fellows come from countries across the world to work with our researchers, support research programs, mentor graduate students, and build alliances to institutions. The Faculty's small size enables PDF to have an outsized impact on our programs of research, collaborative initiatives, and community engagement. Our PDF are successful in securing external funding through NSERC (Banting), Mitacs, Crohn's and Colitis Canada, and the K.M. Molson Foundation, among others. We have begun work with CoGS staff in identifying how best to support our fellows. A PDF Day has been initiated through CoGS and continues to draw attention. We are exploring ways to communicate PDF successes. The Faculty is also looking for ways to bring our PDF together, as they often do not have much opportunity to do so. We are working with CoGS to provide workshops and resources for PDF, including career development, job search, and networking opportunities. We strive to support our PDF with adequate funding and benefits, recognition of their contributions to the Faculty, and support for advancing their careers beyond UBC.



GRADUATE PROGRAMS

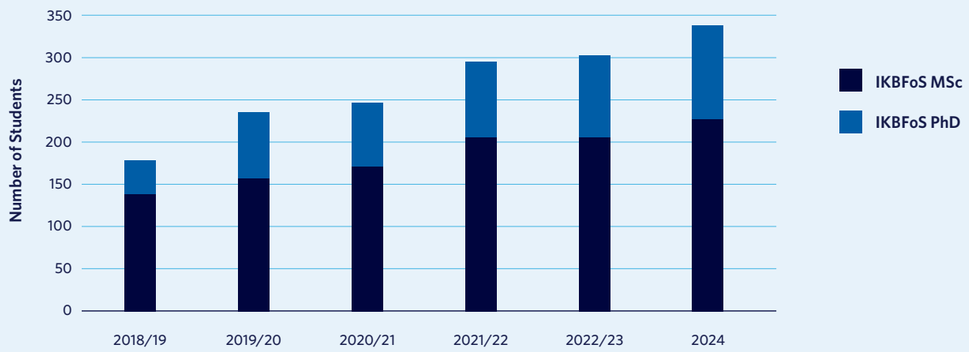
The IKBFoS is the academic home to eight graduate programs, each granting MSc and PhD degrees in their respective disciplines. Each program is research-intensive and thesis-based, and course requirements for each program are tailored to suit the needs of each discipline. Our graduate programs are collaborative in nature, with both inter-program collaborations and community partnerships. As examples, Biology has close ties with agricultural and Indigenous partners in the Okanagan Valley, and Medical Physics offers graduate degrees jointly with BC Cancer - Kelowna Centre. Further partnership details can be found in *Section 6.0.*

At their core, our graduate programs are small, tight-knit communities that are, collectively, growing. The graduate student population is gender diverse (43% female, 41% male, 16% undisclosed/other) and international in nature, with over half of students coming from 36 countries. Our students are successful in securing external funding from NSERC, CIHR and elsewhere; in 2023/24 we have 22 external award holders. Currently, IKBFoS students have 19 NSERC, 2 CIHR, as well as MITACS, Vanier, CSC, and CAGS-Proquest awards. Our students are heavily involved in community-engaged research. They work with Indigenous organizations, government agencies, health authorities, regional municipalities, provincial organizations, and industrial collaborators, which all provide students with opportunities to conduct research with applied outcomes and real-world impact.

Graduate student numbers have doubled since 2018, with some programs growing slowly and others seeing explosive growth, particularly the MSc in Computer Science. These rapid and differential growth rates have affected strategies and processes for the equitable allocation of scholarships, CoGS- and IKBFoS-level funding, and space.

ENROLLMENT BY DEGREE

Annual MSc and PhD Enrollment



ENROLLMENT BY PROGRAM

Number of Students Enrolled in IKBFoS Graduate Masters Programs (2018 – 2023)

Primary Field of Study	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Biochemistry & Molecular Biology*	17	17	15	22	25	29
Biology	51	59	62	61	55	50
Chemistry	11	14	9	11	15	19
Computer Science**	20	29	37	55	55	66
Earth & Environmental Sciences	16	20	28	27	28	31
Mathematics**	13	10	12	19	18	24
Medical Physics**	11	8	8	10	9	8
Interdisciplinary Graduate Studies (IGS)***	1	3	3	5	7	10
Total	**140**	**160**	**174**	**210**	**212**	**237**

Number of Students Enrolled in IKBFoS Graduate PhD Programs (2018 – 2023)

Primary Field of Study	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Biochemistry & Molecular Biology*	5	9	11	19	12	16
Biology	26	31	23	25	26	24
Chemistry	0	9	8	10	7	10
Computer Science**	0	2	5	10	16	21
Earth & Environmental Sciences	6	9	8	14	14	16
Mathematics**	0	14	15	12	13	15
Medical Physics**	2	4	7	9	10	10
Interdisciplinary Graduate Studies (IGS)***	8	7	7	11	9	8
Total	**47**	**85**	**84**	**110**	**107**	**120**

* The BIMB graduate program is jointly administered through the Departments of Biology and Chemistry.

**The COSC / MATH / MEDP programs are all housed within the Department of Computer Science, Mathematics, Physics, and Statistics (CMPS) and are overseen by one Associate Head – Graduate, with PCs acting for each GP.

***IGS: administered by multiple Faculties

Graduate recruitment remains an ongoing challenge for our GPs. Larger universities, including UBCV, have a department dedicated to graduate recruitment. At UBCO, recruitment for graduate programs is left to each individual program, but they do not have the financial or staffing resources to develop effective recruitment strategies. Despite these difficulties, our programs receive competitive numbers of applications.

Graduate Application Statistics for 2024/25 Intake

Program	Applications		Offers		Acceptances	
	MSc	PhD	MSc	PhD	MSc	PhD
Biochemistry & Molecular Biology (BIMB)	14	4	7	2	7	1
Biology (BIOL)	29	6	12	4	6	4
Chemistry (CHEM)	12	13	6	5	6	4
Computer Science (COSC)	502	40	19	8	14	6
Earth & Environmental Sciences (EESC)	33	13	4	1	4	1
Mathematics (MATH)	42	13	9	5	7	5
Medical Physics (MEDP)	22	11	4	2	3	2

As of June 2024, the IKBFoS has 63 active graduate student supervisors, representing 76% of all non-teaching stream full-time faculty. Faculty members on average have between two to six graduate students. In some of our Programs (e.g., EESC, MEDP, BIOL), adjunct faculty play a key role in graduate supervision. Currently, we have 65 adjunct faculty spanning a wide range of research areas and coming from a range of outside institutions, including: Agriculture & Agri-Food Canada, The Dominion Radio Astrophysical Observatory, BC Cancer, Interior Health, and others.

Our graduate students are funded through a variety of sources, with core sources including teaching assistantships (TA), graduate research assistantships (GRA), and CoGS funding by way of Okanagan Graduate Research Scholarships (OGRS). External scholarships (NSERC / CIHR) also play an important role, as described below.

Base Funding Sources and Amounts for MSc and PhD Students with No External Awards

Degree	Minimum	1 GTA	OGRS	GRA
MSc	$20k - $24k	$14,542.56	$2k - $5k	NA*
PhD	$24 - $26.5kk	$15,091.84	$2k - $5k	NA

* GRA values are set by the individual faculty members

Typically, students will take 0.5 to 1 TA per term for a maximum of two terms per year, thus providing $7,271.28 to $15,091.84 per year in graduate TA funding. OGRS are allocated by CoGS annually based on a funding formula, which results in OGRS allocations ranging between $4,000 to $11,000.

Minimum funding levels for PhD candidates is set by CoGS at $24,000 per year. In some cases, IKBFoS GPs (e.g., COSC, MATH, MEDP) set higher minimum funding levels. CoGS and IKBFoS do not currently set minimum funding levels for MSc candidates, though this is being explored by PGs in the Faculty. Our GPs tend to fund conservatively in comparison to other, similar research-based institutions, which makes it difficult for our students to live sustainably in Kelowna.

The IKBFoS is currently home to 347 graduate students, but we can provide only 176 graduate student desk spaces. The COVID-19 pandemic had a further negative impact, as students were forced to work from home full time. Transitioning back to campus, integrating with the limited space, and the lack of a formal graduate student space policy have all contributed to an uneven space usage across IKBFoS graduate spaces. Over the past year, we have worked with PCs and graduate student society leaders to initiate a space sharing system. Our central goal is to be able to track usage (not users) of spaces to understand our student needs and to create a space usage policy that creates a positive and stimulating environment.

Graduate student time in their program is in line with norms at other Canadian institutions (2 to 3 years for MSc, and 4 to 6 years for PhD (*See Appendix E, Graduate Time in Program*)). We are cognizant that a long time in program can be detrimental to overall student success.

Overall, we have a growing cohort of strong graduate students who perform exceptionally well in securing external funding, publishing high-quality and impactful research, engaging with the community, and contributing to the university.

2.3

Continuing and Professional Education

Professional Masters and non-credit programs are relatively new forms of instruction on the UBC Okanagan campus. IKBFoS is expanding its offering of continuing and professional programs, recognizing the opportunity that such programs provide to deliver specialized content on timely subjects via flexible learning approaches and platforms.

Our Faculty is a leader on the UBC Okanagan campus in the development of both Professional Masters and non-credit programs. The highly successful Master of Data Science program, launched in 2018, was the first professional degree taught on the UBCO campus. It has consistently graduated an average of 30 students per year, and demand remains high for competitive placements in the program.

In the spring of 2024, UBCO Senate approved the Master of Biotechnology (MBtec) with final approval from the BC Ministry of Post-Secondary Education and Future Skills (PSEFS) expected in September 2024. The MBtec was conceived in response to the Ministry's tech-relevant seat expansion initiative, which provided 20 funded seats for the new program. Renovations to laboratory space are underway in the SCI Building to accommodate the first cohort of students in September 2025.

UBC has a system-wide commitment to Career and Personal Education, which stems in part from a 2013 Flexible Learning Strategy that identified Career and Personal Education as a key area of activity. The commitment is formalized in the UBC Strategic Plan through strategies for local and global engagement, and transformative learning. The UBC Okanagan campus delivers its non-credit programs through Continuing and Professional Education (CPE), which is administered by the Provost's Office.

The groundwork for continuing education programs at UBC Okanagan was established in 2018 when Senate approved policy O-129, which allows for creation of non-credit credentials. The transition to online course instruction during the COVID-19 pandemic subsequently catalyzed development of digital communication platforms. Those digital resources now provide the capabilities to deliver continuing education courses to a breadth of learners, some of whom have personal and professional commitments that make it challenging to attend lectures on a university or college campus. Remote instruction combined with flexible modes of content delivery have made it possible for individuals to upskill for career advancement without the need to be present regularly, or in some cases at all, on the UBC Okanagan campus.

The Faculty has benefitted from significant support provided by the BC government for creation of non-credit learning opportunities. Our current micro-credential programs *(Critical Skills for Communication in the Technical Sector; Wetland Delineation and Assessment; Fundamentals of Wildland Fire Ecology and Management; Metabolomics)* all have been awarded competitive funding from BC government development grants totaling $377,672. The UBC Okanagan Excellence Fund provided a further $334,360 to support the creation of the *Wildland Fire Ecology and Management* program.

In the fall of 2023, the PSEFS introduced future skills grants (FSGs) as part of the *StrongerBC Future Ready Action Plan*. FSGs provide BC residents aged 19 or older with a one-time allocation of $3,500 for short-term skills training. The majority of micro-credential programs delivered by the IKBFoS have been approved for inclusion in the FSGs program, which has enhanced the visibility of our CPE offerings and boosted enrollment.

Enrollment in Micro-Credentials and Professional Master's (2020 – 2024)

Non-Credit Program	2020	2021	2022	2023	2024
Critical Skills for Communication in the Technical Sector Micro-Credential	70	-	-	31	-
Wetland Delineation and Assessment Micro-Credential	-	-	-	47	23
Fundamentals of Wildland Fire Ecology and Management Micro-Credential	-	-	-	58	-
Metabolomics	-	-	11	-	-
Total	70	-	11	136	23
Professional Master's					
Master of Data Science	31	31	30	40	40*

*projected

The number of Professional Masters and non-credit micro-credential programs is expected to increase during the next five years. The opportunities are myriad for creation of topical specialized programs delivered flexibly. Our non-credit CPE courses provide a means for the Faculty to engage in research extension activities with professionals from industry, government, Indigenous communities, and not-for-profit agencies. Recent changes to provincial legislation regulating the natural resource sector have markedly increased demand for CPE offerings by professionals working in forestry, geoscience, biosciences, agriculture and environmental consulting. To date, a remarkable breadth of organizations and diversity of individuals have enrolled in IKBFoS non-credit programs. The flexible courses also serve as a venue for alumni to re-engage with UBC.

In 2022, UBC Okanagan became an accredited member of the Age Friendly University Global Network, whose core principles include enhanced access and encouragement for older adults to participate in university educational programs. Our non-credit programs attract participants of all ages, and enrollment to date has included retired professionals who aspire to lifelong learning. The Faculty recognizes the value and multi-faceted opportunities offered by CPE courses for enhancing the role of universities in society.

2.4

Undergraduate Student Academic Experience and Support

The academic experience is enhanced by a variety of opportunities available to students in the IKBFoS, with one unique research opportunity funded by the Irving K. Barber Endowment. In addition to the formal programs described below, many students acquire teaching and research experience in volunteer and paid positions.

UNDERGRADUATE RESEARCH

Honours Thesis and Directed Studies Projects

Faculty in many disciplines regularly supervise students in honours thesis and directed studies courses. Between 2018 and 2023, an average of 104 students per year engaged in these research experiences.

Number of BSc Students Participating in Directed Studies or Honours Thesis Courses (2018 – 2023)

	Directed Studies	Honours Thesis	Total
2018/19	27	39	66
2019/20	52	59	111
2020/21	27	70	97
2021/22	45	75	120
2022/23	35	56	91
2023/24	59	80	139

The IKBFoS Undergraduate Research Award

The Irving K. Barber Endowment Fund supports the Undergraduate Research Award (URA) program, which provides a research opportunity for students in the IKBFoS. Students experience the complete research cycle, including developing a research proposal, conducting a summer research project, presenting their results at the URA poster symposium in September, and preparing a brief written report. During the summer months, the URA program advisors meet bi-weekly with URA, IURA and NSERC USRA students to share research experiences, learn from invited speakers, and to mentor students in the development of their research presentation for the symposium.

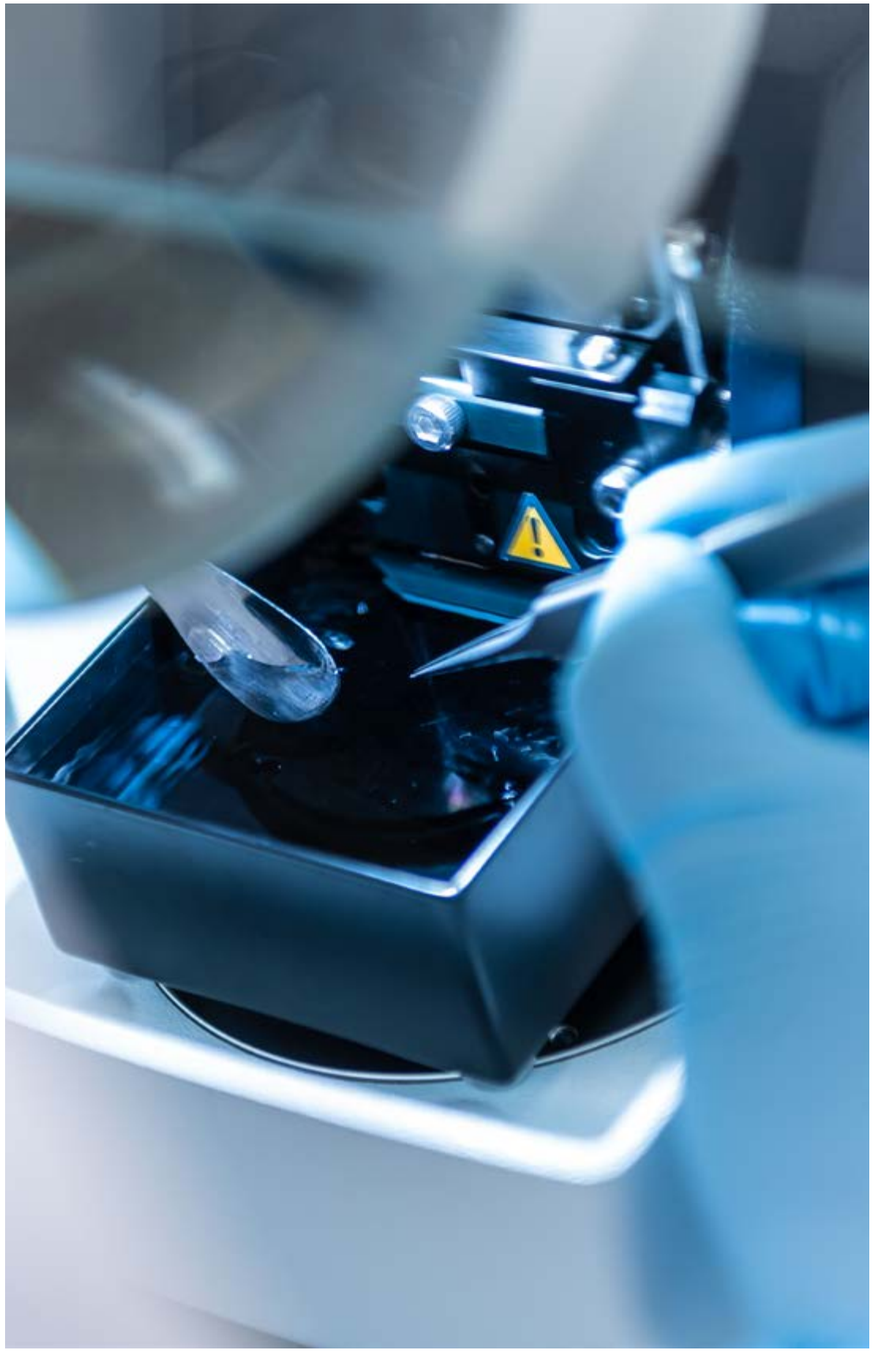
The awards are aimed at students in their third year of study. Students receive a salary stipend of $11,000. The URA program has been offered annually since 2006. On average, about 9 awards are granted each year (ranging from 7 to 12).

The International Undergraduate Research Award

The International Undergraduate Research Award (IURA) is a campus-wide award funded by the International Student Initiative (UBC's international recruitment portfolio). The application process is modeled on the IKBFoS URA application. Students applying for the IURA follow the same process and summer program as described above for the URA. Students receive a salary stipend of $10,000, and up to $1,500 to cover research expenses. The program started in 2017 as a pilot, and 39 international students have now benefited from this additional undergraduate research opportunity.

NSERC Undergraduate Student Research Awards

The number of NSERC Undergraduate Student Research Awards (USRA) available in the Faculty each year is based on a combination of the number of faculty with NSERC Discovery Grants and the total dollar value of those grants. Indigenous and Black Canadian students are eligible for NSERC USRA in addition to the allocation. These students are encouraged to participate in the URA summer program.



Number of NSERC-USRA Recipients (2018 – 2023)

	General Recipients	INDG Recipients	Black Recipients	Total Awards
2021*	12	0	N/A	12
2022*	12	2	N/A	14
2023*	12	3	0	15
2024*	12	3	2	17

*Summer

Other Research Opportunities

Since 2015, Indigenous Programs and Services (IPS) has offered the Indigenous Undergraduate Research Mentorship Program for Indigenous students in STEM disciplines across campus, including BSc students in IKBFoS. Students work with a faculty member or a post-doctoral fellow to gain practical research and laboratory experience. Students are expected to participate in the lab as well as in activities provided by IPS, and they receive a financial stipend for their involvement. Approximately five students have been placed in the IKBFoS each year. The program has been extremely successful, with all students continuing to engage in other research activities (e.g. honours thesis, NSERC-USRA, URA, and conference presentations), and the majority go on to graduate studies or medical school.

International Research Opportunities

Since 2022, the Dean's Office has taken an active role in communicating international research opportunities to students, and supporting interested students with their applications. In summer 2024, two students were offered research positions in Germany.

Curricular and Co-curricular Activities

Go Global

UBC offers student study exchange and research abroad opportunities to all students through the Go Global program. The objective of the program is to offer students a transformational, experiential learning opportunity that promotes global awareness, meaningful engagement, and cross-cultural understanding. IKBFoS students can study abroad through the Go Global program, or by taking a Go Global seminar taught by an IKBFoS instructor during the summer session.

Bamfield Marine Sciences Centre

The Bamfield Marine Sciences Centre is a world-class teaching and research facility located on the outer west coast of Vancouver Island, BC. UBC students can apply to take courses for credit toward their degree at the Marine Centre during summer and fall terms. The River Timothy Sidley Memorial Award allows the IKBFoS to support one or two students for the fall session at $8,200 each.

Women in Science and Engineering (WiSE) Mentoring Program

Women are underrepresented in careers in science and engineering, and research has shown that mentoring programs help to retain women in their professions. The short-term goal of the WiSE Mentoring Program is to support and assist young women studying sciences and engineering to achieve their academic goals and prepare them to transition to professional careers.
The long-term goal of the mentoring program is to provide students with awareness, tools, and a network to help to retain them in science and engineering careers in their 30s and early 40s, when they are faced with family and life/work balance pressures, and gender-based challenges at work. The program uses a triad model, which includes two student mentees and one industry (or a graduate student) mentor. The program appears to be unique globally because it is accompanied by a research ethics approved prospective longitudinal study. Student mentees may participate after completing their first year, and many return for two and three years. On average, about 45 BSc and BASc students have participated in the program annually since 2011 (with hiatus during COVID-19).

Other Opportunities

Many departments and degree-programs have student-run clubs, called Course Unions, which are funded by the Student Union. These groups offer a variety of academic and non-academic activities including tutoring, workshops, organized trips to conferences, fundraising, and social events. A faculty member in the department or program typically liaises with their Course Union.

Course Unions in IKBFoS include: Biochemistry; Chemistry; Computer Science; Earth & Environmental Science; Environmental Chemistry; Microbiology; Sustainability, and Quantitative Sciences.

Work Experience

Co-op Education

The UBC Okanagan co-op program is a competitive program open to undergraduate students. Co-op positions can be four, eight, or twelve months in length and can start at any time of the year. Prior to the first co-op term, all applicants must have completed two years of their undergraduate degree, passed a pre-screening requirement, and have participated in pre-employment training. During pre-employment training, students receive one-on-one résumé and cover letter review services, job search strategies, interview preparation, career advice and personalized support to assist in securing work-term employment.

Since 2018, 327 students from the Faculty have participated in the co-op program and completed 819 placements. Most of the placements are in Canada, but some student placements were in countries such as the USA, China, Germany, Indonesia, and Malaysia. IKBFoS students have worked in a variety of industries and sectors ranging from research, lab environments, fieldwork, government, non-profit organizations, small- and medium-sized businesses, and multinational organizations.

Academic Services

IKBFoS students have access to academic support offered centrally by student services.
The Dean's Office works closely with the units described below to support students in need.

Student Advising

The central academic advising team is the first point of contact for students. The top three academic advising categories are course/degree planning, policies and guidelines, and program information/ course requirements. In 2022, there were 35,290 separate points of contact with IKBFoS students.

Departments also appoint faculty members who provide discipline-specific program advising to students, such as program- and course-specific information, and information on career opportunities.

Disability Resource Centre

The Disability Resource Centre (DRC) is a resource and service centre for students that ensures educational equity for those who have a disability, illness, or injury and experience barriers in an educational setting. There are currently 447 IKBFoS students registered with the DRC.

Health & Wellness Centre

The Health and Wellness Centre includes the health clinic, counseling, and campus health (health promotion and education on campus).

Indigenous Program and Services (IPS)

The primary goal of Indigenous Programs and Services (IPS) is to provide culturally-appropriate services and support to First Nations, Metis, and Inuit students. IPS provides various support services including academic advising, a peer mentor program, liaison and outreach with Indigenous sponsors, communities, and schools, liaison with UBC faculty and staff, networks with Indigenous staff at other universities, administrative support, cultural activities, and computer facilities.

Global Engagement Office

The Global Engagement Office (GEO) provides advising, transition services, and programs for international students on campus. GEO aims to ensure an integrated, safe, and celebratory environment for international students through holistic student support to promote student success and create a sense of institutional affinity and belonging. GEO serves undergraduate and graduate students as well as post-doctoral fellows. GEO has staff who are Regulated Canadian Immigration Consultants (RCIC) and who are legally certified to advise students on immigration and work permits in Canada.

STUDENT SURVEYS

UBC administers three surveys to current undergraduate students on a range of topics to provide a comprehensive picture of the educational experience at UBC: the Canadian Campus Wellbeing Survey (CCWS); the Undergraduate Experience Survey (UES); the National Survey of Student Engagement (NSSE, results not included below since only one year of data is available). Students indicate their program of study (e.g., BSc, BSust) in the surveys, which provides Faculties with feedback. In addition, IKBFoS held two focus group sessions with a total of 12 students (work study and URA, IURA, and NSERC-USRA students) in July 2024 *(Appendix F. Main Themes from the IKBFoS Focus Groups for Self Study (July 3/4, 2024).* Students commented that they appreciate that their survey responses are reviewed by the Faculty, and that changes are implemented.

While the CCWS questions ask about the institution, student perceptions will be largely the result of their experience in courses and programs within the Faculty. In general, more than 70% of BSc and BSust students surveyed feel that the UBCO environment is respectful, that the university values diversity and inclusion, and they feel respected regardless of personal characteristics or background *(Appendix G. Undergraduate Surveys, Table G.1).* Their feelings are slightly more positive than other students at UBCO.

The UES asks more questions about the student academic experience. Note that response rates are low, and have been declining over the past few years, which can lead to response bias. Generally, between 43 and 49% of IKBFoS students feel their overall experience in the Faculty is Excellent or Very Good *(Appendix G, Table G.2).* The majority are Very Satisfied or Satisfied with their overall academic experience, and, not surprisingly, are more satisfied with the upper-level courses in their major *(Appendix G, Table G.3).* In the focus groups, students appreciated the quality of their professors/ instructors, who they consider to be knowledgeable and with relevant background to the subject they are teaching, they consider their professors as approachable and accessible, and they appreciate the innovative and high teaching standards that make for enjoyable classes. The UES results indicate that student experiences in courses is mixed. Students in IKBFoS consistently feel that only in some courses do instructors provide clear learning goals, use various methods to present content/information, and provide helpful feedback *(Appendix G, Table G.4).* Students in the focus groups felt that they were very well supported in first- and second-year classes, and that the university provides a range of services they can access including: The Student Learning Hub, Supplemental Learning, Course Unions, and faculty program advisors

The UES asks students to indicate their level of proficiency in their understanding of various societal issues compared to when they started at UBC *(Appendix G, Table G.5).* In comparison to other students at UBCO, fewer IKBFoS students (generally less than 30%) indicate high levels of proficiency in understanding Indigenous worldviews, awareness of Truth and Reconciliation, and the recognition of Indigenous peoples' rights, understanding of social issues, global issues, and racial inequality and social injustice. Students in the focus groups are aware of the absence of this material in their courses, and they suggested that programs list and recommend interesting courses offered in other Faculties that could be taken as electives, including: History of Science and Medicine; Indigenous perspectives on health; biomedical ethics; science fiction; philosophy of science. In addition, they commented on the lack of training in science communication in the BSc, both oral and written, and recommended this be addressed more explicitly in the degree. Perhaps because the students in the focus group were engaged in summer research projects, they also identified a need for more upper-year statistics courses, particularly aimed at non-statistics majors, with more emphasis on application. They also recognized a need for better training in a software and coding that is relevant for applied work (e.g. MAPLE, MATLAB, Python, R).

About half of the students in IKBFoS Strongly Agree or Agree they feel they belong in the Faculty, and feel a sense of community *(Appendix G, Table G.6).* Students in the focus groups felt a sense of camaraderie with their classmates, they enjoy the smaller campus and smaller upper-level classes, and they appreciate the lack of competitiveness amongst students that they felt might be present at a larger campus.

Students appreciate the experiential learning opportunities provided in their courses, by the IKBFoS, and the campus. They valued the hands-on experience they acquire in courses, especially in labs; they are delighted to be learning PCR techniques, or dissecting three different vertebrates, thereby acquiring skills that they will use in future careers or graduate studies. Students feel that the research opportunities provided in courses (Directed Studies, Honours thesis) and by the Faculty (Undergraduate Research Award, International Undergraduate Research Award, NSERC-USRA) give them insight into their courses and help to prepare them for graduate school. During the focus groups they listed the transferable skills they are acquiring in their research experiences, including collaboration, time management, personal responsibility, and professional skills such as how to prepare for and participate effectively in lab meetings. The UES has surveyed student participation in experiential learning activities at UBC since 2022 *(Appendix G, Table G.7).* IKBFoS students generally participate in these activities at higher rates than all other students at UBCO.

We explicitly asked students in the focus group to discuss weaknesses in the BSc, and to offer suggestions to improve the degree, most of which have been discussed above. Many of their criticisms were predictable (classes are too large; some professors struggle to teach large classes; not all courses listed in the calendar are offered; course schedules can run from 8 am to 9 pm), but they also indicated that they understood the context (e.g. that the lack of teaching space results in evening classes), and offered many helpful suggestions, some of which the Faculty can readily implement. The students were clearly engaged with their education, and willing to contribute to making the experiences of future students even better.

3.0

RESEARCH, SCHOLARLY, CREATIVE AND PROFESSIONAL ACTIVITY

3.1

Scholarly Activities At a Glance

Faculty and highly qualified personnel (HQP) in both research and educational leadership streams in the IKBFoS work together, and with an expanding network of partnerships, to advance scientific knowledge and to tackle critical issues in our society, economy, and health.

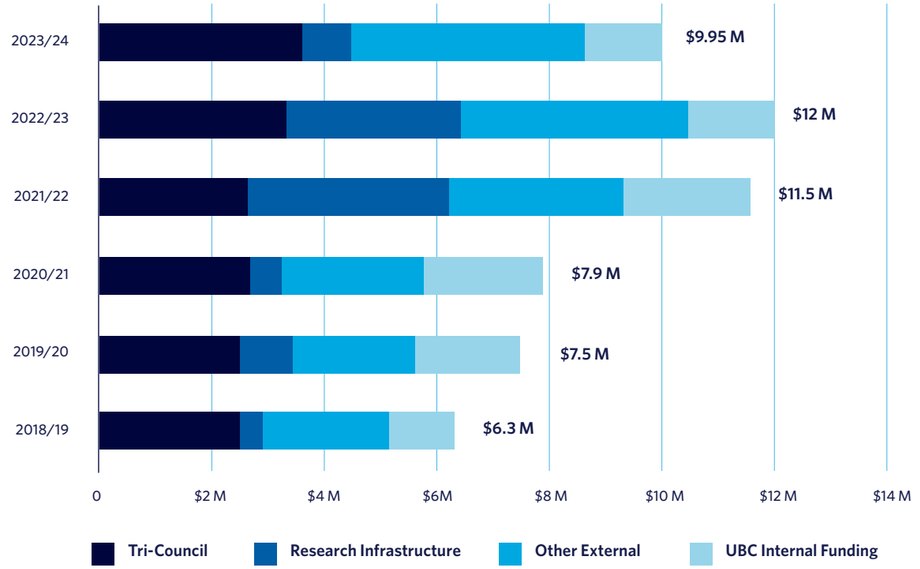
Our research expertise spans from nanostructures to the universe, from molecular forces to tectonic movements, and from pure mathematics to artificial intelligence. We have strong research impact and activity across all three of our academic pillars: *Sustainability & Climate Resilience, Life Sciences for Agriculture & Health, and Computational & Data-Intensive Sciences.* These pillars in IKBFoS encompass all four research strengths across UBC Okanagan *(Resilient Environments, Healthy People, Emerging Technologies, and Thriving Communities).* They also directly align with the *Climate Adaptation & Disaster Resilience* core research focus of UBC Okanagan, and support UBC as a whole in its climate emergency response.

Research funding and infrastructure investments in IKBFoS have steadily increased as the Faculty has grown and increased its numbers of faculty and HQP. Total funding over the past five years has increased from $6,359,194 in the 2018/2019 fiscal year to $9,952,126 in the 2023/2024 fiscal year *(see Appendix H, IKBFoS Research Funding* for research funding at departmental levels). There was also a significant increase in research infrastructure investment after the establishment of the Faculty from the former IKBSAS, notably in the 2021/2022 and 2022/2023 fiscal years *(see Section 8.0 Physical Infrastructure* for a review of Faculty research infrastructure).

Our faculty members are internationally, nationally, and locally recognized. At UBC Okanagan, IKBFoS is home to four active Canada Research Chairs, four UBC Okanagan Principal's Research Chairs, three endowed & industrial research chairs, and four active Michael Smith Health Research BC scholars. Except in our first year as a new Faculty in 2021, IKBFoS faculty have been named UBC Okanagan's "Researcher of the Year" consistently in the natural sciences & engineering category. Our Faculty's research and scholarship excellence in wildlife conservation science has also brought the first grant-tenure faculty position to the Okanagan campus in 2023, thanks to our partnership with the non-profit organization, Biodiversity Pathways.

Collaborative interdisciplinarity is key in our scholarly activities. Researchers in IKBFoS have participated in 17, and led/co-led 13, of the total 26 UBC-funded Eminence research clusters since the beginning of this program in 2017 on the Okanagan campus (and 9 of 15 currently active Eminence clusters) *(see Section 1.3)*. Our faculty members also lead two, and participate in five, of the six research institutes at UBC Okanagan, of which one was developed from a successful Eminence cluster led by IKBFoS. In addition, our faculty members actively participate in research and knowledge extension activities across both main campuses of UBC as members of the Biodiversity Research Centre, Clean Energy Research Centre, Language Sciences Institute, Wine Research Centre, Centre for Wildfire Coexistence, and Climate Solutions Research Collective.

Research Funding by Award Category (2018-2023)



Research Contributions to the IKBFoS Academic Pillars 3.2

3.2

Research Contributions to the IKBFoS Academic Pillars

SUSTAINABILITY & CLIMATE RESILIENCE

Climate change, and the increasing human footprint on ecosystems, are defining issues of our time. In anticipation of, and in response to increasingly destructive environmental processes, including wildfires and other climate change-related disturbances, researchers in IKBFoS have developed several research and knowledge extension programs centered around sustainability and climate resilience. Relevant emerging interdisciplinary research initiatives in IKBFoS share the common themes of transitioning from reactive to proactive climate-resilient strategies. Many of these lines of research are integrated in the Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES), which include researchers from all four IKBFoS departments.

Our research in ecology and landscape management is highlighted by the "Living with wildfire in the BC Southern Interior" Eminence cluster, which integrates various disciplines to address wildfire challenges in the Thompson–Okanagan region, one of Canada's most fire-prone landscapes. A partnership with Rogers Communications on wildfire prevention and smart forests builds community and ecological resilience using 5G technologies-based real-time monitoring. IKBFoS plays a key role in UBC's strategies for wildfire and disaster resilience. We have partnered with the Faculty of Forestry (Vancouver) to establish the dual campus Centre for Wildfire Coexistence, and are currently collaborating with the Faculty of Health & Social Development (FHSD) (Okanagan) and the School of Engineering (SoE) (Okanagan) to accelerate climate resilience research capacity on the Okanagan campus. In addition, the Centre for Environmental Assessment Research focuses on environmental impact in natural resources development, as well as the intersection between climate change and wildfire assessment. IKBFoS also hosts wetlands research as well as watershed studies and knowledge extension initiatives in partnership with Forest Renewal BC to work on sustainability and management of ecosystems around waters. These lines of research and innovation are conducted with a strong focus on the local contexts of the Okanagan, and with genuine relationships and close collaborations with Indigenous communities in the region.

In advancing resilient solutions, an Intelligent Analytics research network led by faculty members in the CMPS study artificial intelligence, modelling, and robotics with environmental applications. Our faculty members constitute an integral part of the newly-funded US–Canada's Global Centre on Climate-Resilient Western Interconnected Grid with partners across Canada and the US (in BC, Alberta, Saskatchewan, Utah, California, and New Mexico) to develop power grid resilience for one of the two major interconnected power grids in North America, in the face of climate-related extreme disturbances. Our resilient solutions research also address energy needs with the "Solar energy for net zero" Eminence research cluster, in partnership with the SoE, to develop low-cost ways to harness and store solar energy.

Energy research, together with studies on atmospheric chemistry as well as novel chemical and bio-catalysis, constitute our approach towards sustainable processes and chemistry. In addition, the Fipke Laboratory for Trace Element Research (FiLTER) develops methods for determining the distribution and geological age of previously-undateable minerals, enabling targeted exploration of critical minerals for transitioning to a greener economy using lithium and nickel.

Proactive biodiversity conservation, and the broader effort to restore biodiversity and cultural connections to nature, are key for a future of sustainability and resilience. Toward this end, our researchers have been developing robust predictive frameworks for biodiversity conservation and wildlife restoration ecology approaches to explore and mitigate the impact of human activities and disasters, including massive wildfires, on ecosystems. These efforts have been aided with big data studies using cutting-edge ecological data analysis tools to gauge the resilience of wild populations to changing conditions, enabling links between behavioural flexibility of wild animals to conservation efforts. Importantly, our works in this area link healthy landscapes, as well as plant, wildlife and water sciences in a broader sense, to reconciliation efforts.

LIFE SCIENCES FOR AGRICULTURE & HEALTH

A core strength and important intersection with the *Sustainability & Climate Resilience* pillar is our sustainable agriculture research. This is especially relevant for the Okanagan region, in which agriculture and viticulture-based tourism are major contributors to the economy. Our researchers in the Department of Biology use genomic approaches to assess soil microbial functionality and plant genetic diversity to develop a way forward for carbon-absorbing agriculture. Interventions are being jointly developed with partners in the agriculture sector and faculty members in CMPS to integrate machine-learning, drone technology, and data analytics for precision agriculture solutions that can reduce waste and improve wildlife management in and around agricultural spaces. IKBFoS is also home to an NSERC/Egg Farmers of Canada Research Chair whose research centers around sustainability assessment and improvement in agricultural production. At the same time, in the face of wildfires and their impact on crops, including grapevine and winemaking, our research develops protection strategies for in-vineyard smoke-taint grapevines as well as integrates climate data analytics with analytical chemistry and sustainable agriculture practices. In addition to plant genetics and microbiology, research in the Wine Research Centre, co-led by IKBFoS, develops protection strategies for in-vineyard smoke-taint grapevines to address the impact of wildfires on grapevine and winemaking. Our researchers also integrate climate data analytics with analytical chemistry towards sustainable agriculture practices.

In health research, medical physics has emerged as a strength of IKBFoS and UBC Okanagan with notable achievements in adaptive and high-precision radiotherapy. With the success of the "Medical physics and data analytics" Eminence research cluster, our researchers and their partners continue bridging data analytics, medical physics, and radiation oncology through the recently-established Institute for Analytics in Medical Sciences (AiMS) and the "Personalized cancer radiotherapy" Eminence cluster. These clusters share a vision of establishing UBC Okanagan as a national hub for oncology research, training, and care. The health research portfolio in IKBFoS also includes outstanding studies in understanding and treating nutritional and metabolic diseases, neurodegenerative disorders, cancer, and lung diseases. Our research focuses on the impact of human metabolism, gut microbiome, and dietic regimes on diabetes, colitis and related diseases, and thereby developing gastroenterological biotherapeutic products. We also conduct many lines of research in nervous system health, including signalling, apoptosis, neuroimmune responses, and neurogenesis, with a long-term vision to understand cellular functions in cognitive disorders (such as Alzheimer's disease) and identify therapeutic targets. With immunotherapy as a promising approach to treat cancers, the IKBFoS-led "Immunobiology" Eminence research cluster develops next-generation techniques to monitor immune cells. In parallel with these applications-driven research, our biochemists and biophysicists continue to explore the fundamental structures and mechanisms in living systems that can lead to treatment of diseases, including bacterial infections and metabolic disorders.

Bridging health and agriculture is IKBFoS reaseach in plant chemistry and biotechnology, which bring together experts in genomics, metabolomics, and natural products biochemistry to investigate the chemical diversity of plants and develop biotechnology approaches to harness plant chemicals and genetics. Our works include some of the most crucial plants for food (flax, breadfruit), industry (grapevine, sunflower, lavender, cannabis), and anticancer agents (happy tree) with important achievements in establishing relevant genomic, metabolomic, and biocatalytic resources. These lines of research have been enabled by the state-of-the-art Plant Growth Facility, established in 2020, and spearheaded by faculty members in the Departments of Biology and Chemistry.

COMPUTATIONAL & DATA-INTENSIVE SCIENCES

While central in the Department of Computer Science, Mathematics, Physics and Statistics (CMPS), Computational & Data-Intensive research, teaching, and innovation activities take place in all four IKBFoS departments. Notable areas of expertise include research in intelligent analytics and optimization. An IKBFoS-led Intelligent Analytics hub has emerged as an interdisciplinary cluster that integrates computer science, mathematics, and data science to advance data-driven research with an extensive network of national and international partners. Their research topics include machine learning, natural language processing, artificial intelligence, robotics, topological data analysis, cybersecurity and computer vision. These activities have a wide range of applications in health, environment, economy, education, and social issues. The established Centre for Optimization, Convex Analysis and Non-smooth Analysis (COCANA) brings together experts in IKBFoS and SoE for fundamental research in mathematical analysis and optimization. Their works enable practical solutions for industrial and commercial problems such as road design optimization, integration of complex data from multiple sources, network optimization, and signal processing. Our research in mathematical biology and data science, integrates mathematics and statistics into insights about our world. Applied mathematics, computational statistics, systems modelling, and other complex analysis tools developed in IKBFoS have shed lights on ecological processes, including climate events, wildfires and the associated financial risks.

Data-intensive research is a prominent hallmark in the works of our astrophysicist, who joins Canadian and International scientists in the Canadian Hydrogen Intensity Mapping Experiment (CHIME) team with an ambitious goal of measuring the expansion history of the universe. CHIME is a radio telescope with a raw data rate of more than ten terabits-per-second which is processed to advance our understanding of the evolution of the universe and our own Milky Way galaxy. Other lines of data-intensive research are intertwined with computational chemistry and computational biology, including computational ecology. Using simulation, modelling, and testing in combination with laboratory experiments, our researchers answer complex questions in solid-state systems, protein chemistry, interfacial phases (liquid, solid, gas), nanoparticles, mineral surfaces, and organometallic complexes with implications in biological, environmental and material sciences.

Our research in artificial intelligence (AI) and human-computer interactions is an outstanding example of interdisciplinarity and collaboration in pushing the frontier of innovation in robotics, image/video processing, and machine learning. Working together in a seamless and open space (Innovation Precinct), faculty members and trainees explore new ways to design mobile user interfaces, augmented/virtual/mixed reality interaction technologies, information visualization, object tracking/recognition, and pattern recognition. The applications of their works can be found in technologies for health care robotics (for children and older adults), precision agriculture, image enhancement, and video surveillance. Research using large language models develop behaviour change systems and persuasive technologies in mobile and web applications as well as new ways to work with code intelligence and software engineering, including the integration of diversity and other social aspects. As AI is rapidly changing our world, IKBFoS researchers co-lead the “Data safety and AI literacy” Eminence cluster in collaboration with researchers in social sciences and engineering towards helping the general public understand AI. Furthermore, this cluster and other research programs in machine learning, generative AI, and multi-agent large language models, contribute to developing AI frameworks and governance strategies where human inputs and experience play a central role. Working together, faculty, academic staff, and students across IKBFoS, and their partners, continue to advance data- and exploration-driven ways of understanding nature and anthropogenic systems, thereby enabling innovative solutions for a sustainable and climate-resilient future.

3.3

Scholarship of Teaching and Learning

Research and education are intertwined in IKBFoS classrooms, which are the laboratories of many of our educational leadership stream professoriate. Educational leadership faculty members work across all of our programs, contributing to advancing and enhancing pedagogical methods and approaches in higher education. The science and practice of team-based learning, experiential education, and open education are all being advanced by IKBFoS faculty members.

Since 2018, faculty members in the educational leadership stream have authored and co-authored 37 peer-reviewed research papers, including 18 on various topics of science education (of which 17 are with IKBFoS faculty as corresponding authors and 14 were published in or after 2020, the year IKBFoS was established). In addition to new knowledge delivery methods, these lines of research have provided new freely-distributed and open-source learning technologies such as the Course Gamification platform for programming training with over 2,000 exercises, Teamble Analytics for quantifying and improving students' team works, and UBC Curriculum MAP for program quality assessments with users across UBC's campuses, Okanagan College, and 12 other higher education institutions in Canada, Australia, Ghana, and the Philippines. Our faculty include an internationally-recognized leader in team-based learning who has supported both colleagues and students' pedagogy for over a decade. In 2024, our educational leadership faculty also created an open educational resources textbook for second-year cell biology (in partnership with faculty at Oregon State University), which has been adopted by three other universities in North America besides UBC and OSU, with almost 17,000 unique users around the globe. Also since 2018, in addition to EL faculty, research-stream faculty members have contributed seven peer-reviewed papers on science education, of which five are with corresponding authors in IKBFoS. Our faculty members have received many of UBC's and national teaching awards. In addition to initial successes in OER projects on biology curriculum, IKBFoS is home to two of the four inaugural UBC's *Open Educational Resource (OER) Excellent & Impact Awards* in 2024 in both the individual and group categories. All of these initiatives and efforts demonstrate our commitment to providing an open and affordable education when training next-generation scientists and informed citizens.

Aspiration, Opportunities and Challenges Ahead 3.4

3.4

Aspiration, Opportunities and Challenges Ahead

Building on past achievements and current strengths, IKBFoS strives to stay at the frontiers of science and innovation with deepening connections to our partners in academia, communities, industry, and practitioners. IKBFoS aspires to be a critical research and training hub, a bridge connecting the Okanagan to global science and innovation, and a key actor in advancing UBC's climate adaptation strategies and sustainability in the BC Interior.

Opportunities for research and innovation as the pathway to a resilient future:

The climate emergency and geopolitical uncertainties of our time create acute challenges to be managed and opportunities to explore creative solutions. Both require research and innovation to which IKBFoS can make meaningful contributions. Being situated in one of the most wildfire prone areas of Canada allows IKBFoS faculty and trainees to conduct research at the forefront of natural and anthropogenic perturbations, especially those linked to climate change. As climate adaptation and disaster resilience has been identified as a core focus at UBC Okanagan, expertise from IKBFoS has been instrumental in establishing and spearheading UBC Okanagan's proposed Centre for Climate Resilience Research (with FHSD and the SoE) and the dual-campus Centre for Wildfire Coexistence (with the Vancouver campus-based Faculty of Forestry). Together with colleagues and partners across UBC and beyond, we will directly address some of the most pressing tasks in UBC's Climate Action Plan as well as Canada's National Adaptation Strategy. To these ends, we will deepen and expand our Sustainability & Climate Resilience pillar, especially in fire ecology, advanced modelling and analytics (climate, landscape, and fire behaviour), remote sensing, smart fire management, and smart agriculture that help advance our understanding of climate change-related disasters as well as provide practical solutions for local communities, businesses, and practitioners. Research into the impacts of wildfire on human health from molecular mechanisms to health care practices will also be a focus in collaborations with colleagues in FHSD.

Sustainable technologies and management strategies are essential parts of our resilient future. National and international plans to address the Sustainable Development Goals (SDGs) adopted by all United Nations members will continue to drive research, innovation, and partnerships in IKBFoS. Our current works form the foundation for foci throughout the three academic pillars in sustainability, life sciences, and computational sciences to provide solutions towards at least 13 of the 17 SDGs. Canada's strategies in "Biomanufacturing and Life Sciences" (2021), "2030 Biodiversity" (2023), and "Net-Zero Emissions by 2020" (2024) are important guidelines to shape our efforts. In addition, AI safety and resilient governance strategies are being prioritized nationally and internationally (e.g. Canada's 2024 "Securing AI advantage" plan, European Union's 2021 AI Act, and the USA's 2023 Executive Order on AI) as AI and robotics solutions are becoming indispensable for a wide range of applications and services, including health care for our aging populations. Based on the current initiatives in IKBFoS and partners across BC, these realities are creating conditions to accelerate research and innovation in AI safety, explainability and human-centric governance strategies.

Opportunities in interdisciplinarity, education and partnership:

IKBFoS faculty and trainees built on the close-knit campus community in the early days of UBC Okanagan, and a strong interdisciplinary research and innovation environment created through various initiatives including the Eminence cluster program, and have worked closely with each other and collaborators throughout all of our three academic pillars. Through many collaborative projects, including two NSERC Strategic Partnership grants and 18 NSERC Alliance grants in the past five years, we have addressed new questions in basic science as well as worked on practical solutions for current issues ranging from climate adaptations, biodiversity, sustainable development, to public health demand, multidisciplinary integration and knowledge exchanges. In addition to the Centre for Climate Resilience Research and various Eminence research clusters, IKBFoS is actively exploring partnership opportunities in computer science and computer engineering research and training with the SoE. By pushing the edges of computer science and engineering together, we aspire to build up UBC's Okanagan campus as a place of high-impact computational solutions for sustainability, health, and digital technologies.

The newly-created state-of-the-art collaboration for innovation space in the x̌əl sic snpax̌nwixʷtn building on the Okanagan campus will enable unprecedented opportunities for interdisciplinary and partnership endeavours led by our researchers in all academic pillars, namely the Intelligent Analytics hub (pillars 1 and 3), the Integrative Bioscience hub (pillar 2), the Watershed Ecosystems hub (pillar 1), the Biodiversity hub (pillar 1), the Community-Based Computation for Climate Actions hub (pillars 1 and 3), and the Human-Technology Experiment hub (pillar 3). Beyond campus and in addition to wildfire related issues, the agricultural and viticultural industries in the Okanagan provide opportunities for interdisciplinarity and cooperation. To this end, our current researchers and new hires in the anticipated Michael Smith Laboratories in the Okanagan, and continuing Wine Research Centre, will focus on interdisciplinary works in plant biology, biotechnology, and food economics.

The strategic advantage of being located in the BC Interior also helps the Faculty advance our interdisciplinarity and cooperation. Collaboration opportunities provided by the proximity of the Okanagan campus to the NRC's Dominion Radio Astrophysical Observatory (in Kaleden, BC), AAFC's Summerland Research & Development Centre, and BC Cancer's Kelowna regional centre. Such partnerships will support not only our research and innovation in all three academic pillars but also our education, including the upcoming Master of Biotechnology and anticipated Bachelor of Radiation Therapy programs. With the recently renewed Interior University Research Coalition (IURC) partnership, our collaboration with Thompson Rivers University and the University of Northern British Columbia are anticipated to be expanded and strengthened in resilience, ecosystem, and health research set by previous IURC projects.

Aspiration, Opportunities and Challenges Ahead 3.4

Opportunities for internationalization:

Tightly linked with interdisciplinarity and cooperation, international partnerships are a prominent feature of the research and innovation enterprise in IKBFoS with the shared interests in answering fundamental questions in science. We currently have a wide range of collaborative projects with partners across the world on human–computer interactions (Mexico), landscape and wildlife ecology (Kenya, US), astronomy (Australia, US), structural geology (Nepal), photocatalysis (India), hydrology (China), and more. Importantly, emerging global issues have accelerated cross-border partnership opportunities as demonstrated by our participation in the US–Canada's Global Centre on Climate-Resilient Western Interconnected Grid (pillars 1 and 3), the international Square Kilometre Array radio telescope project (pillar 3), Canada–Germany's cohort of sustainable chemistry and processes projects (pillars 1 and 2) and 7 other ongoing NSERC Alliance International grants. As Canada joined the Horizon Europe research & innovation program in 2024, collaborations with partners in the European Union and associated countries will play a particularly important role in laying the ground for major endeavours in the years to come. In Asia, IKBFoS has initiated conversations towards more comprehensive partnerships based on our existing collaborations with academic and industry partners in countries that are identified by Canada's 2022 Indo-Pacific Strategy as key economies for science, technology and innovation partnerships (Japan, South Korea) and top global trading partners of Canada (Japan, South Korea, Vietnam). These initiatives, and an expanding network of international alumni including short-term visiting international research students, are the foundation that propels our global impacts and connects the Okanagan to the global science and innovation ecosystem.

Our international collaboration network will also benefit from the diverse and inclusive environment we foster in the Faculty. Connections developed by individual faculty members, whose early training took place outside of Canada, will help IKBFoS leverage international partnership opportunities, especially those developing countries targeted by the Canadian International Development Scholarships 2030 (with focuses on STEM, AI, climate action, and health sciences) and Canada's International Development Research Centre (with foci on climate resilient food systems, global health, and education and science).

Connection and infrastructure needs for long-term impacts:

Meaningful connections are central to the future development of IKBFoS. Among the most important connections are our engagements with local communities, including Indigenous people. In parallel with indigenizing the curriculum, engaging the leadership and participation of Indigenous groups in our research have been most significant in projects related to ecology, landscape management, wildfire, and biodiversity conservation (pillar 1). Initial engagements have been made to create spaces for interactions between researchers and Indigenous peoples in mathematics, statistics, and plant science (pillars 2 and 3). More strategic efforts need to be made to expand such spaces in a meaningful way.

Connections beyond the region are also critical for IKBFoS, which is located geographically far removed from major global technology hubs. We will continue to build on existing collaborations with partners with connections to major technology corporations such as those in Vancouver, Tokyo and Ibaraki (Japan), and Monterrey and Guadajalara (Mexico). IKBFoS will also pursue opportunities to join and support the collective efforts of the Okanagan campus, UBC as a whole, as well as Canada's governments at various levels, to boost our connections to key industry and innovation players around the world.

Importantly, we will step up efforts to consolidate connections internal at UBCO to address issues related to limited resources as usually seen on a growing campus. The growth of scholarly activities in IKBFoS and the Okanagan campus as a whole, continually outpace the growth of research infrastructure. IKBFoS will work towards effective administration and technical research supports operating across various research units, including those outside our Faculty, to enable researchers and educators to concentrate on large-scale and/or more impactful projects. In the coming years, IKBFoS will also focus efforts to improve research infrastructure under the guiding principles of creating shared research facilities with multiple users, including those from other units, and creating opportunities for sustainable maintenance and growth; outstanding examples include the shared Imaging Facilities and Analytical Chemistry Facilities to be housed in the new ẋəl sic snpaẋnwixʷtn building. These facilities will help boost research capacity in existing research programs (including some that are currently hindered in the *Sustainability & Climate Resilience* and *Life Sciences for Agriculture & Health* pillars due to the lack of such facilities, attract talented researchers from around the world to the Okanagan, support our academic and professional programs, and promote IKBFoS and UBC Okanagan as an innovation hub for communities and businesses in the BC Interior.

4.0

LEADERSHIP AND ADMINISTRATION

The IKBFoS prioritizes honesty, integrity and transparency in all Faculty-level decision-making processes.

Our Faculty is led by our Dean, four Associate Deans, four Departmental Heads and a team of research and administrative professionals *(Figure 4.1)*.

The Dean provides the Faculty with high-level strategic direction and is the chief academic and administrative officer of the Faculty. The Dean contributes to campus-level leadership and direction through their position as a member of the Dean's Council and of the Okanagan Leadership Council. The Dean also represents the Faculty externally, playing a key role with donor and alumni relations, government relations, and at public events.

The roles of the Associate Deans are currently divided into four portfolios:

ASSOCIATE DEAN, FACULTY AND RESEARCH

The Associate Dean, Faculty and Research provides leadership and oversight for the Faculty's research, scholarly activities, and collaborative initiatives and partnerships. The portfolio is also responsible for the development, implementation, and sustenance of a multi-year strategic personnel plan that promotes proactive recruitment, retention, career advancement, recognition, and ongoing success of an excellent and diverse community of colleagues. Their responsibilities include:

- Designing, reviewing, and implementing a Faculty research plan;
- Providing leadership in developing Faculty hiring strategies for programs and departments;
- Offering leadership and support for research initiatives that promote Indigenous inclusion and the values of respect, relationship, responsibility and reverence as outlined in the UBC 2020 Indigenous Strategic Plan
- Supporting and cultivating a Faculty research culture based on principles of equity, diversity and inclusion.

ASSOCIATE DEAN, GRADUATE AND POSTDOCTORAL TRAINING

The Associate Dean, Graduate and Postdoctoral Training provides administrative and academic, leadership, management, and support for research-based graduate students and post-doctoral trainees. They promote community, affinity, and supportive peer networks to continue the advancement of programs and activities within the Faculty. Their responsibilities include:

- Facilitating recruitment, admission, registration, and advising of graduate students;
- Meeting and providing guidance and support for student leaders representing the various graduate program student societies;
- Working with the curriculum committee, departments, Faculty and the College of Graduate Studies on interdisciplinary and disciplinary programs and opportunities;
- Providing oversight for graduate student awards and support for student scholarship applications.

ASSOCIATE DEAN, STUDENTS (UNDERGRADUATE RECRUITMENT, SERVICES AND SUCCESS)

The Associate Dean, Students (Undergraduate Recruitment, Services and Success) provides leadership for the development, implementation and sustenance of a strategic and holistic framework that ensures success for our undergraduate students throughout their life-cycle– from prospective students to graduates. Their responsibilities include:

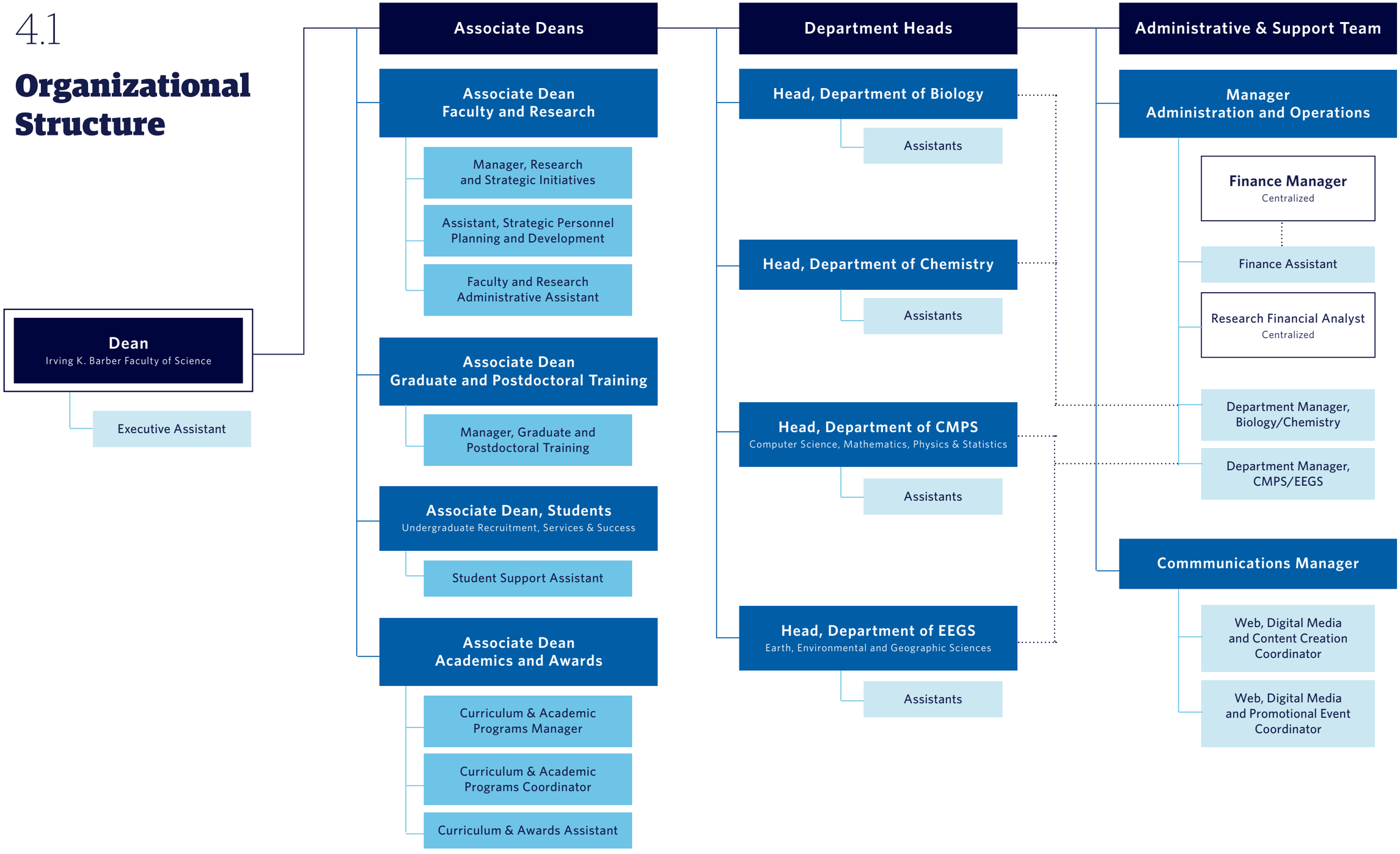
- Coordinating undergraduate enrollment planning and management;
- Managing effective and efficient recruitment activities;
- Facilitating admission and registration of high-quality students;
- Ensuring delivery of excellent educational experiences, both curricular and extra-curricular;
- Promoting of community, affinity, and supportive peer networks;
- Facilitating access to relevant services, including academic and non-academic advising and support.

ASSOCIATE DEAN, ACADEMIC AND AWARDS

The Associate Dean, Academic and Awards provides leadership for the development, implementation, and sustenance of a strategic approach to teaching, learning, and curriculum that is of the highest quality, pedagogically sound, fiscally prudent, socially responsive and adaptive; and facilitates the realization of competencies and outcomes that reflect our core mission and values. Their responsibilities include:

- Facilitating curriculum innovation and renewal within the Faculty, of cross-Faculty and cross-institutional collaborative programs, and of related consultation, approval, and implementation processes;
- Providing ongoing monitoring of curriculum effectiveness;
- Conducting formal, regularly-scheduled self-studies and external reviews of academic programs;
- Promoting effective and efficient experiential and co-curricular learning programs;
- Supporting and enhancing innovative teaching and learning initiatives;
- Promoting a culture of recognition for innovative curricula and pedagogical accomplishments.
- Managing undergraduate awards and recognitions related to teaching, learning and research.

4.1 Organizational Structure



5.0

PEOPLE, ENVIRONMENT AND CULTURE

The University of British Columbia consistently ranks as one of British Columbia's top employers, one of Canada's greenest employers and best diversity employers.

We are proud to be part of a highly-regarded institution, and we are strongly aligned with UBC's values including equity, diversity and inclusion, health and wellbeing, Indigenous engagement and sustainability.

WORKPLACE ENVIRONMENT

The creation of theIKBFoS into a new, independent academic unit marked a milestone for faculty and staff working in the sciences, and UBC Okanagan as a whole, creating the opportunity to support development of research and teaching in science disciplines. One of the many benefits of this transition was the creation of a Leadership Team that is fully committed to the departments and programs that comprise the Faculty.

The 2021 UBC workplace experience (WES) survey showed that overall 74% of staff and 79% of faculty in IKBFoS are satisfied with their current roles, and 84% of staff and 81% of faculty are proud to say they work at UBC. Overall workplace dimension scores were high for both faculty and staff. The lowest ranking dimensions for both faculty and staff were related to communications (feeling well informed about what others are doing) and confidence and trust in senior UBC leadership. Professional growth, inclusion and respect, senior leadership, and student focus were the top influences identified as contributing to engagement by faculty and staff. We are using these results to inform our actions and communications as a Faculty.

While the last survey highlighted the increased challenges and stressors faced by the Faculty, post-pandemic, it also highlighted the resilience and adaptability that have led to improved job satisfaction for many. The restructure of the Faculty also added a layer of complexity to these experiences, making the survey a crucial tool for understanding and addressing the needs of faculty and staff.

We are scheduled to complete a further survey in the fall of 2024, which will not only build upon the insights gained from the last survey, but will also be an opportunity to provide valuable data to inform decision-making and policy development, reflective of the current academic landscape.

Many of the responses to the communications dimensions in the survey are likely related to the timing of the survey in relation to pandemic-related remote work. Since 2021, we have been working to provide more timely communications regarding Faculty processes and events through internal newsletters and communications, and verbally in the form of updates and information on faculty projects, to all faculty and staff during Faculty Council meetings. We have also provided more opportunity for increased visibility and in-person contact for faculty, staff and leadership at social and academic events, and improved accessibility in a post-pandemic world in regards to in-person and hybrid work and study environments. We are conscious of the importance of physical space and how it symbolizes the social function of the Faculty. We are developing a revised plan for the Faculty's administrative office to increase visibility and accessibility, while recognizing that physical presence is only one of many building blocks. In 2024, we have invested in expanding our Faculty communications team to provide more timely website and other communications updates, and we have expanded our leadership team composition to include Department Managers in addition to Department Heads, to facilitate information transfer from leadership to department members.

We are working to ensure all members of our community understand our actions and goals in the context of Faculty membership in a larger campus and University system. As members of the larger UBC system, many of our Faculty-level decisions are driven by institutional strategy and directions, and we are constantly working to align the strategic goals of our own Faculty with broader initiatives. In particular, the swift evolution of UBC's Okanagan campus has considerably changed academic support staff requirements and affordability. Some functions that were previously supported centrally, now fall to Faculty support staff, driving the Faculty to review and align processes to best serve the University. Delivering our action commitments will require additional capacity, and as a result, we are working to reassign staff to facilitate some of these services.

The lack of capacity to support Faculty operations is evident in the WES survey. WES results showed that only 40% of faculty members felt satisfied with the support services available to them. Only 37% of staff responded that they felt the amount of work required of them is reasonable, and that they had energy left for their personal life at the end of the workday. While we have increased and reviewed staff roles over the past few years to address these concerns, we still face capacity and workload issues in numerous portfolios, leading to significant concerns for the wellbeing of our staff. We find our organizational sustainability routinely challenged in the context of UBC's requirements and expectations for Faculty administration.

The recent deployment of Workday Student – the University's new student enterprise software – launched this year has presented an unanticipated increase in workload for staff, some faculty, and leadership. While our colleagues at UBC Vancouver may have more people in key student-facing positions to take advantage of Workday's optimization and flow, in the Okanagan, it is safe to say that Workday Student has exponentially increased the workload for already under-resourced staffing levels in academic Faculties.

This example is one of many of the challenges faced in operating a Faculty on a smaller campus within a larger university system. The responsibility to maintain and enhance quality in all aspects of our activity, and the thin employment market for faculty and staff, especially in a non-metropolitan area, is a challenge. There is a lack of capacity to address crucial areas of development, ranging from operational matters such as representation on campus-wide committees and working groups, to capacity to address vital university initiatives such as the UBC Indigenous Strategic Plan, UBC StEAR Framework, and the implementation of Workday and Student Workday.

There are, of course, enormous benefits to being part of a larger university as well, that should not be disregarded. Our Faculty and campus are supported by numerous centralized services, ranging from human resources, to finance, research, and library services, that would not be available at a smaller institution. The challenge is one of finding the right size to meet our aspirations, given available financial and human resources.

FACULTY CAREERS

Faculty career progression, ranks and expectations are outlined in the UBC Faculty Association Collective Agreement. As a Faculty, we are well supported by institutional resources and processes that govern the terms of appointment, reappointment, promotion and tenure (APRT). We recognize the profound implications these processes have for individual faculty members' career paths, and for recruiting and retaining outstanding faculty members.

A key outcome of the creation of our Faculty is reflected in increased levels of startup funding and infrastructure support for new faculty hires in both research and educational leadership streams relative to the former IKBSAS. We have also increased our strategic support for faculty-led research and educational leadership through the appointments of a Special Advisor for Educational Leadership and a Manager for Research and Strategic Initiatives, both within the Dean's office portfolio.

To address concerns raised regarding ARPT expectations, we engage in informal mentorship to support pre- and post-tenure colleagues working towards promotion. In addition, we provide procedural clarity by locating formal ARPT procedures within the responsibility of the Associate Dean, Faculty and Research. We are also committed to improving and maintaining faculty member communications in regards to this process.

EMPLOYMENT EQUITY

We are commited to being a positive and inclusive space for all faculty, staff and students. In 2023, UBC's Associate Vice President, Equity and Inclusion (AVPEI) introduced the Strategic Equity and Anti-Racism (StEAR) framework to guide the university's approach to implementation of equity and anti-racism priorities, and evaluation of progress.

Recently, we have conducted a Faculty-level self-assessment of progress towards StEAR framework objectives. We have appointed two faculty members as our Equity, Diversity and Inclusion (EDI) leads to represent IKBFoS in our campus-level community of practice. Our leads are mandated to identify and address gaps in EDI, and to advise the Dean on how best to address them. These positions are supported by a graduate-level Work Study student.

In addition to Faculty culture and processes, we recognize that representation matters. We are working to increase our levels of representation of designated groups across all of our employment groups. Presently, only 28% of our tenure- and non-tenure track teaching and research faculty members are women, although, this number is higher for assistant professors (41%). Amongst Department Heads, Associate Deans and Dean *pro tem*, 33% are women. In contrast, 80% of our staff are women. Our proportion of racialized employees (faculty and staff combined), is higher than the campus average, and significantly higher than representation in the regional workforce.

Teaching and Research Professionals and Support Staff Equity Report (2020 – 2024)

			Women[1]	Indigenous People[2]	Racialized People[3]	People with Disabilities[4]	2SLGBQIA People	Transgender People[5]
		Respondents	% out of Respondents					
2020-21	Teaching/Research	73%	28%	0%	19%	sup.	sup.	0%
	Support Staff	65%	77%	sup.	sup.	sup.	sup.	0%
2021-22	Teaching/Research	82%	34%	sup.	21%	12%	5%	0%
	Support Staff	91%	75%	sup.	sup.	sup.	sup.	0%
2022-23	Teaching/Research	87%	35%	sup.	25%	9%	6%	0%
	Support Staff	96%	74%	sup.	17%	11%	11%	0%
2023-24	Teaching/Research	88%	33%	sup.	30%	7%	5%	0%
	Support Staff	96%	80%	sup.	18%	14%	12%	0%

Teaching and Research Professionals: adjunct, sessional lecturer, research associate, post-doctoral fellow, lecturer, part-time, without review, and tenure stream faculty members (does not include visiting faculty)
Support Staff: all full-time and part-time staff appointments (except student employees)

A new version of the Equity survey was introduced in October 2021, with a revised questionnaire to improve overall participation in the survey. Changes include:

[1]Previous iterations of UBC's Employment Equity Census questionnaire asked about sex (Female/Male).
[2]Language was updated from previous iterations of the Employment Equity Census questionnaire to use the term "Indigenous" instead of "Aboriginal".
[3]Language was expanded to include the terms "racialized" and "person of colour" in addition to "visible minority". The term "racialized" is used as a more current term than "visible minority" from the Employment Equity Act (1995).
[4]Question was revised in 2020 from previous iterations of the Employment Equity Census questionnaire by removing use of the term "disability" or "disabilities" from the body of the question in efforts to be more inclusive of individuals who experience an impairment, functional restriction, limitation, and/or barrier but who may not self-identify as "disabled" or having a "disability".
[5]Wording has changed (trans, transgender, gender-fluid, or an analogous term was removed).

The percentage for women, transgender, Indigenous peoples, racialized people, people with disabilities, and 2SLGBQIA+ People is out of Employment Equity (& Inclusion) Survey Respondents.

sup. (suppressed): Categories where the headcount is fewer than 5 people have been suppressed to protect the privacy of respondents.

The table displays a unique count of paid employees as of November 1st each year.

6.0

PARTNERSHIPS AND COMMUNITY ENGAGEMENTS

A scouting flight to monitor wildlife populations in northern BC as part of our conservation partnership and outreach activities with Tsay Keh Dene First Nation and Kwadacha Nation.

Photo Credit: Landon Birch

6.1

Indigenous Partnerships

IKBFoS is working towards building meaningful and mutually beneficial partnerships with Indigenous communities on the three key themes of research, learning & teaching, and service as set out in the 2020 UBC Indigenous Strategic Plan and the 2019 UBC Okanagan Declaration of Truth & Reconciliation Commitments.

Many IKBFoS researchers partner with Indigenous communities to explore and develop frameworks for Indigenous knowledge sharing, Indigenous-led conservation and ecosystem governance, reconciling Indigenous rights with conservation regulation, and bridging gaps between Indigenous and non-Indigenous communities.

Notably, ecosystem restoration projects led by our researchers in BRAES played a pivotal role in reaching a nationally-significant partnership agreement on conservation between the Governments of Canada, British Columbia, and Saulteau and West Moberly First Nations (BC) in 2020 towards growing the population of certain wild animals to self-sustaining levels that are consistent with Aboriginal & Treaty Rights on harvesting activities by Indigenous communities. Indigenous-led conservation and environmental impact assessment frameworks have also been explored and developed by BRAES and CEAR with the traditional practice and knowledge sharing by the First Nations across BC (Gitxsan Nation, Heiltsuk First Nation, Simpcw First Nation) and Canada (Sipekne'katik First Nation, Seneca People, Vuntut Gwitchin First Nation). In addition, faculty members in IKBFoS have contributed their expertise to other works on Indigenous governance of ecosystems (with the Central Coastal Indigenous Resource Alliance in BC), equitability in impact benefit agreements (with the Wet'suwet'en First Nation in BC), Indigenous-led conservation (with the Huu Ay Aht, Tla-o-qui-aht, and Toquaht First Nations in BC) and Indigenous knowledge sharing (with the Magnetawan First Nation in Ontario, the Kitasoo Xai'xais First Nation in BC, and the Inuit).

Recent efforts in our Faculty, led by an Indigenous student, have incorporated Indigenous values and language into the decolonizing process of computer science using the aforementioned Course Gamification platform. These efforts are part of a UBC's Aspire Learning Transformations project led by five faculty members at various ranks in both research and educational leadership streams towards revising the undergraduate computer science curriculum to improve equity, diversity and inclusion.

We continue to build and foster our research connections with the Syilx Okanagan Nation through numerous research projects focused on Okanagan land, water and wildlife stewardship. Of note, the "Watershed ecosystem science" and "Enhancing ecosystem sustainability" Eminence clusters address the challenges of using Indigenous knowledge and western science to influence policy change and conservation practices in the Syilx territory.

Knowledge extension activities based on research led or developed by IKBFoS faculty members also play a key role in our Indigenous engagement and reconciliation efforts. In addition to regular forums on topics of Indigenous knowledge and ecosystems organized by BRAES, IKBFoS has held meetings (e.g., 2021 Annual One River Ethics Matter Conference, 2024 Wildfire Coexistence in BC) and field tours for hundreds of participants, and involved members of Indigenous groups in various roles ranging from attendees to organizers and leading panelists. Other outstanding examples include the annual Community Water Forums (2017–2021), the Peachland Watershed Knowledge Exchange Workshop (2021) and Field Tour (2023), and engagements with Syilx traditional ecological knowledge keepers (2022) and community members (2023) organized by the IKBFoS-led Watershed Management Research Extension Program. In particular, the IKBFoS micro-credential program "Fundamentals of Wildland Fire Ecology and Management", was recently developed with land-based pedagogy and Indigenous knowledge.

Our Indigenous engagement is expected to be further facilitated with the establishment of IKBFoS-led research hubs in the ǩəl sic snpaǩnwixʷtn building, including the anticipated knowledge extension activities on the inclusion of Indigenous knowledge in modelling studies in partnership with the Banff International Research Station for Mathematical Innovation & Discovery. Furthermore, the development of the West Campus Lands as set out in the 2023 conceptual structure plan will enable future land-based research and training opportunities in agriculture, ecology, and geology in close connection with the Syilx Okanagan peoples.

With the first Indigenous full-time tenure-track faculty member starting in 2024, and plans for future hires of Indigenous backgrounds, we continue to foster an inclusive and equitable environment informed by Indigenous perspectives.

INDIGENOUS-LED CONSERVATION

IKBFoS members in BRAES have helped recover and build a sustainable conservation pathway for a nearly extirpated population of caribou, a species with a central role in the material and cultural lives of Indigenous peoples across Canada. This Indigenous-led conservation initiative combines short-term population recovery, predator reduction and maternal penning with long-term habitat protection for the Klinse-Za caribou population on the traditional lands of the West Moberly and Saulteau First Nations (BC). Initial successes including doubling the population (38 to 101 from 2013 to 2021) allowed the First Nations and their partners to reach a historic conservation agreement between the Government of British Columbia, Environment & Climate Change Canada, and the two First Nations to further the innovative collaboration that protects the caribou population while upholding the culture and stewardship of the West Moberly and Saulteau peoples on their lands.

Photo Credit: Nikanèse Wah tzee Stewardship Society (NWSS)
A not-for-profit collaboration between West Moberly First Nations and Saulteau First Nations, NWSS is working to recover the local caribou population.

Partnership for Research Collaboration, Innovation and Education 6.2

6.2

Partnership for Research Collaboration, Innovation and Education

Our faculty and HQP are engaged with a large number of external community partners spanning local and provincial health authorities, provincial and federal government ministries in environment, agriculture & climate change, Indigenous communities, not-for-profit agencies, and industry. Our collaborations encompass both long-standing partnerships (e.g., Okanagan Nation Alliance, Agriculture & Agri-Food Canada, BC Ministry of Water, Land and Resource Stewardship) while others are newer engagements (e.g., Matt3r.ai). IKBFoS researchers also play a key role in supporting and enabling collaborative research on the UBC Okanagan campus.

Throughout UBC, IKBFoS researchers play leading roles in many dual-campus research and education initiatives, including the Centre for Wildfire Coexistence (co-led by IKBFoS and the Faculty of Forestry), the Wine Research Centre (co-led by IKBFoS, the Faculty of Management, the Faculty of Land & Food Systems and the IKBFASS), and the UBC Climate Solutions Research Collective. Our faculty members are actively participating in other research and knowledge extension clusters, including the Biodiversity Research Centre, Centre for Artificial Intelligence Decision-Making & Action, Clean Energy Research Centre, Centre for Chronic Disease Prevention and Management, Institute for Community Engaged Research, Language Sciences Institute, Institute for Healthy Living and Chronic Disease Prevention, and Materials and Manufacturing Research Institute. Beyond UBC, our works also constitute the core activities of multi-institution initiatives such as the Pacific Institute for Climate Solutions, Pacific Institute for the Mathematical Sciences (including serving as a site of the Banff International Research Station), and Interior Universities Research Cluster of BC. IKBFoS-led Eminence clusters, institutes and centres also include non-UBC members and collaborators from BC (Simon Fraser University, Thompson Rivers University, BC Cancer, BC Ministry of Forests) and beyond (University of Toronto, University of Saskatchewan, Wilfred Laurier University, SUNY at Albany). Internationally, IKBFoS faculty members have built connection networks across the globe with partners in the US, Germany, France, Australia, Mexico, China, Spain, Japan and the UK among others as mentioned earlier.

With federally-established research & development organizations, IKBFoS has developed extensive collaborations in all three academic pillars. Our collaborations with Agriculture & Agri-Food Canada's Summerland Research & Development Centre (BC) have addressed major issues in agriculture (e.g., cherry frost tolerance, invasive plant biocontrol, cover crop optimization, vineyard health, mycrorrhizal symbiosis, pollination, pest resistance) and Indigenous food sovereignty of traditional foods. Our astrophysicist is working in close partnership with researchers at the National Research Council's Herzberg Astronomy & Astrophysics Research Centre, specifically its Dominion Radio Astrophysical Observatory (DRAO) in Kaleden, BC, to understand the evolution and structure of the universe. This partnership includes the use of DRAO's facilities for collaborative projects with numerous DRAO scientist adjunct faculty members contributing to the training of our undergraduate and graduate students and post-doctoral trainees since 2019. Research trainees have the opportunity to do their work at DRAO, and all students are able to experience this unique facility on class tours.

Among partnerships with non-profit organizations, our developing relationship with Biodiversity Pathways constitutes an example with significant achievements to support research in landscape and wildlife conservation and restoration. This partnership includes direct engagements between four IKBFoS faculty members (including a CRC) and three adjunct researchers from Biodiversity Pathways, enabling the hiring of three new staff members including an Indigenous community coordinator. Other partnership-sponsored scholar positions in IKBFoS include an NSERC/Egg Farmers of Canada research chair in sustainability, and the Forest Renewal BC-endowed research chair in watershed management (currently vacant). The latter chair was part of the long-established and ongoing IKBFoS-led Watershed Management Research Extension Program, which fosters research collaborations, knowledge mobilization and extension on watershed-related issues.

Collaboration with industry partners is critical in translating our scholarship to innovative and societal solutions. Recent examples include development of smart technologies for real-time monitoring of forest and conditions related to wildfire risk (with Rogers Communications), social robotics with health and educational applications (with Honda Research Institute – Japan), and cybersecurity and financial risk modelling (with Scotiabank). IKBFoS faculty members, including a BC Centre for Agritech Innovation's ambassador, are also helping drive the industrial and academic network expansion in the agricultural technology sector in BC. Numerous projects spearheaded by IKBFoS researchers in collaboration with pharmaceutical, agricultural, financial, analytical, and technological businesses in the Okanagan and across North America, have also been providing solutions for industry challenges, with a total funding of more than $1.78 million from these companies since 2018. Such partnerships also create valuable training environment for our HQP with more than $1 million funding through the research internship program, Mitacs Accelerate, in the fiscal year 2023/2024 alone.

The Faculty's collaborations and partnerships have supported the development of our professional programs (as mentioned earlier) and facilitated the practical co-operative work experiences for students enrolled in our programs. Since 2018, 327 IKBFoS students have completed 819 co-op placements, most of which took place in Canadian companies and agencies such as AgriForest Bio-Technologies Ltd., Environment & Climate Change BC, Cisco Systems Inc., FortisBC, BC's Interior Health Authority, KF Aerospace, Loblaw Companies Ltd., QHR Technologies Inc., Royal Bank of Canada, Scotiabank, Statistics Canada, and WorkSafe BC. An outstanding example of partnership for graduate-level education is the collaborative Pan-Canada Computational Chemistry Course program, established by our faculty members in partnership with colleagues across institutions in four provinces. Started in 2023, the program offers high-quality training in applied computational chemistry, setting a strong example in advancing sustainable and internationally-extendable education for a small academic field that on average has only one faculty member per university department in Canada.

Our close community partners include:

- Agriculture & Agri-Food Canada
- BC Cancer
- BC Ground Water Association
- Westbank First Nation
- Okanagan Nation Alliance
- En'owkin Centre
- Okanagan Xeriscape Association
- Regional District of the Central Okanagan
- Interior Health
- School District 23 (Kelowna)
- Okanagan Basin Water Board
- BC Energy Regulator
- Biodiversity Pathways
- Okanagan Nation Alliance
- Egg Farmers of Canada
- Forest Renewal BC

Public Engagement and Community Outreach 6.3

6.3

Public Engagement and Community Outreach

IKBFoS continuously engages the public with regular Faculty-level community-facing events as well as individual faculty member-led outreach activities targeted at various groups in the community.

The Distinguished Speaker Series is the Faculty's premiere community engagement activity that provides a platform for global leaders to bring their expertise, experience, and perspectives to the Okanagan. Through this series, we have recently featured a prominent journalist (2021), a science communicator (2022), an author (2023), and Nobel laureate and business leader (2024). The series has covered a wide range of issues from data literacy, cognitive biases, modern chemistry, and EDI in business, and has directly engaged 400–800 members of the public every year. Other community-facing events includ public seminars and symposia, most notably the 2024 panel on learning to live with wildfire that brought together researchers, Indigenous fire keepers, and fire agencies for a discussion with 600 attendees.

IKBFoS faculty and staff members have developed wide-reaching resources for parents and school teachers as well as running workshops for teachers. CMPS faculty members have designed and made available a website that evaluates the suitability of various computational-thinking activities and commercial products for children at different ages and stages, an online scavenger hunt that enables families to solve computational puzzles together, and "R Trix for Kids" applications for data visualization and simulation.

Our public engagement activities have attracted community groups including several public schools in the Central Okanagan School Districts 22 (Vernon) and 23 (Kelowna) with events centered around computer science, chemistry, and general science on UBC's Okanagan campus or at their locations. The Chembassadors expose school children aged 6–17, as well as public groups including those in home school programs, to basic chemical principles and laboratories with their hands-on activities. The highly-entertaining and informative live action demonstration, "Element of Danger", by faculty members in the Department of Chemistry, has become a signature event at Destination UBC and Experience UBC, as well as at the chemistry open house during the National Chemistry Week, which attracts 1,000 visitors to UBCO. Our faculty members also play a key role in increasing the visibility of chemistry education and research of IKBFoS, as well as the Canadian Institute of Chemistry, through participation in local events (e.g., Downtown Kelowna Block Party, social media, Okanagan Regional Science Fair). In addition, we work closely with the Development & Alumni Engagement Office to showcase our research and education at various events, including welcoming community members to visit our research laboratories.

IKBFoS faculty, staff, and students were instrumental in establishing the UBCO STEM Collaborative, and together with other units across the Okanagan campus have brought 500–700 school students to campus for the annual STEM Day since 2022. In 2023 alone, the Collaborative organized 26 engaging activities in chemistry, computer science, and general science tailored for local students in grades 3 and 4. In addition to joining the annual STEM Day, the "Let's Talk Science" team, led by IKBFoS staff and students, has been delivering free and hands-on science outreach events since 2018 to youth in Kelowna and throughout BC, including those with rural, Indigenous, and francophone groups. Each year, the program organizes 50–200 activities, with the participation of 1,800–8,600 school children and youth, and also provides support to other outreach teams (e.g., "Medicine in Your Garden" by the Department of Chemistry's faculty and students) covering topics in biology, biochemistry, chemistry, computer science, data science, health, mathematics, physics, environment, and earth science.

7.0

SUPPORT FOR THE UNIVERSITY AND CAMPUS STRATEGIC PLANS

7.1

UBC Strategic Plan

The UBC Strategic Plan outlines the purpose of the institution as: *Pursuing excellence in research, learning and engagement to foster global citizenship and advance a sustainable and just society across British Columbia, Canada and the world.*

This purpose underlies all of our Faculty's activities, it drives our commitment to engagement with community partners, it is embedded in our academic program learning outcomes, and is reflected in the quality and impact of our research and scholarship of teaching and learning.

Our undergraduate programs have been designed with this purpose in mind, with the goal of introducing students to global challenges, preparing them to contribute to advancing a sustainable and just society, and exposing them to Indigenous approaches and worldviews. The Bachelor of Sustainability program, launched in 2022, was a direct response to the purpose, scope and mission of the institution, and is built to train graduates to be leaders of positive change.

The strategic plan identifies the creation of collaborative, interdisciplinary research clusters focusing on problems of societal importance as a core area of significant transformational potential. As described elsewhere in this self study document, our faculty members are engaging broadly in interdisciplinary research clusters funded by the UBC Okanagan Eminence fund, and have led the campus community in establishing interdisciplinary and community-engaging research hubs in the new x̌əl sic snpax̌nwixʷtn building.

The three themes of inclusion, collaboration and innovation are reflected in our past and future directions. We seek to embed equity and diversity across all of our Faculty-level processes, and we are currently developing formal Faculty-level supports and resources to accomplish this goal. Collaboration is a core theme in our research activities and is pivotal to the future development of our Faculty *(see Section 10)*. Innovation drives the science that we do, and is integral to our graduate and undergraduate training experiences.

7.2

UBC Indigenous Strategic Plan

The UBC Indigenous Strategic Plan (ISP) identifies direct goals and actions that the institution can take to support meaningful reconciliation and to become a leading voice in the implementation of Indigenous peoples' human rights.

The Faculty has begun to implement its contribution to the total campus effort to support indigenization, decolonization, and reconciliation. We have made active progress on implementation of Goals 1 (Leading at all levels), Goal 3 (Moving research forward), Goal 4 (Indigenizing our curriculum) and Goal 6 (Recruiting Indigenous People). Our leadership team has engaged in a Faculty-level self-assessment of our alignment with the ISP, identified gaps, and is leading through development of initiatives at all levels in support of the goals of the ISP. As described above, our researchers are deeply committed to respectful and reciprocal engagement with Indigenous communities. We are in the process of increasing Indigenous content in our undergraduate program with a 3-credit Indigenous Studies required course for all BSc students starting in 2024. We are deeply committed to improving the recruitment of Indigenous students and are dedicated to working with the Indigenous Programs and Services Office to identify opportunities to engage more effectively with Indigenous communities and students. Presently, 5% of our undergraduate students are Indigenous. We are actively recruiting Indigenous staff and faculty, and are currently seeking to fill two open faculty positions in Indigenous science.

7.3

Aspire 2040: Shaping UBC Okanagan's Future

The 2040 plan for the UBC Campus lays out bold objectives for growth, from our present size to a campus of 20,000 students. Since its inception in 2020, the IKBFoS has accommodated substantial growth in undergraduate and graduate student numbers, has increased its faculty cohort by 10% and its research funding by 30%. We retain aspirations for growth, within the limits allowed by our physical space, financial and human resources. Our three pillars – *Climate and Sustainability, Life Sciences for Agriculture and Health,* and *Computational and Data Intensive Sciences* – all represent areas of strength in which we feel there is capacity to recruit a diverse and international student body, develop new professional and continuing education programs, and enhance research impact and activity.

Transformative learning:

Over the past few years, we have increased our support for curricular innovation in the Dean's Office by creating two new staff positions, developed and delivered new professional and continuing education programs, tripled our graduate student numbers, and worked closely with the College of Graduate Studies to increase our support for graduate student programs and activities. In addition, our faculty members have been actively leading open educational resources initiatives with recognized achievements. *See section 2.0, Academics.*

People and places:

As described in the sections above, our level of community engagement and partnerships are strong in our community and we are deeply committed to place-based research. We support our undergraduate students in accessing global and national study opportunities and in engaging in capstone, co-op, community service learning, and research-based experiential learning opportunities.

Research excellence:

We are recruiting and supporting outstanding researchers to our Faculty, as evidenced by the exponential growth in research activity and HQP training, and by significant investments in research infrastructure over the past few years. As described in *Section 3.0*, our research has local and global impact, and we are a leading, research-intensive Faculty on the Okanagan Campus

8.0

PHYSICAL INFRASTRUCTURE

Research and teaching activities of the IKBFoS are housed primarily in three buildings on the UBC Okanagan campus: Science (SCI), the Charles E. Fipke Centre for Innovative Research (FIP), and Arts & Sciences Centres (ASC). During the past five years, the Faculty has acquired significant new research space in the Innovation Precinct Annex 1 (IP1) and the Plant Growth Facility (PGF). Forty-eight academics affiliated with IKBFoS recently were allocated new research space in the x̌əl sic snpax̌nwixʷtn (X̌SSAAC Building) through a competitive collaborative team process. The new building is scheduled to open in March 2026.

The IKBFoS has the largest complements of faculty, staff and students on the UBC Okanagan campus and consequently, also has one of the largest space footprints.

ADMINISTRATIVE & OFFICE SPACE

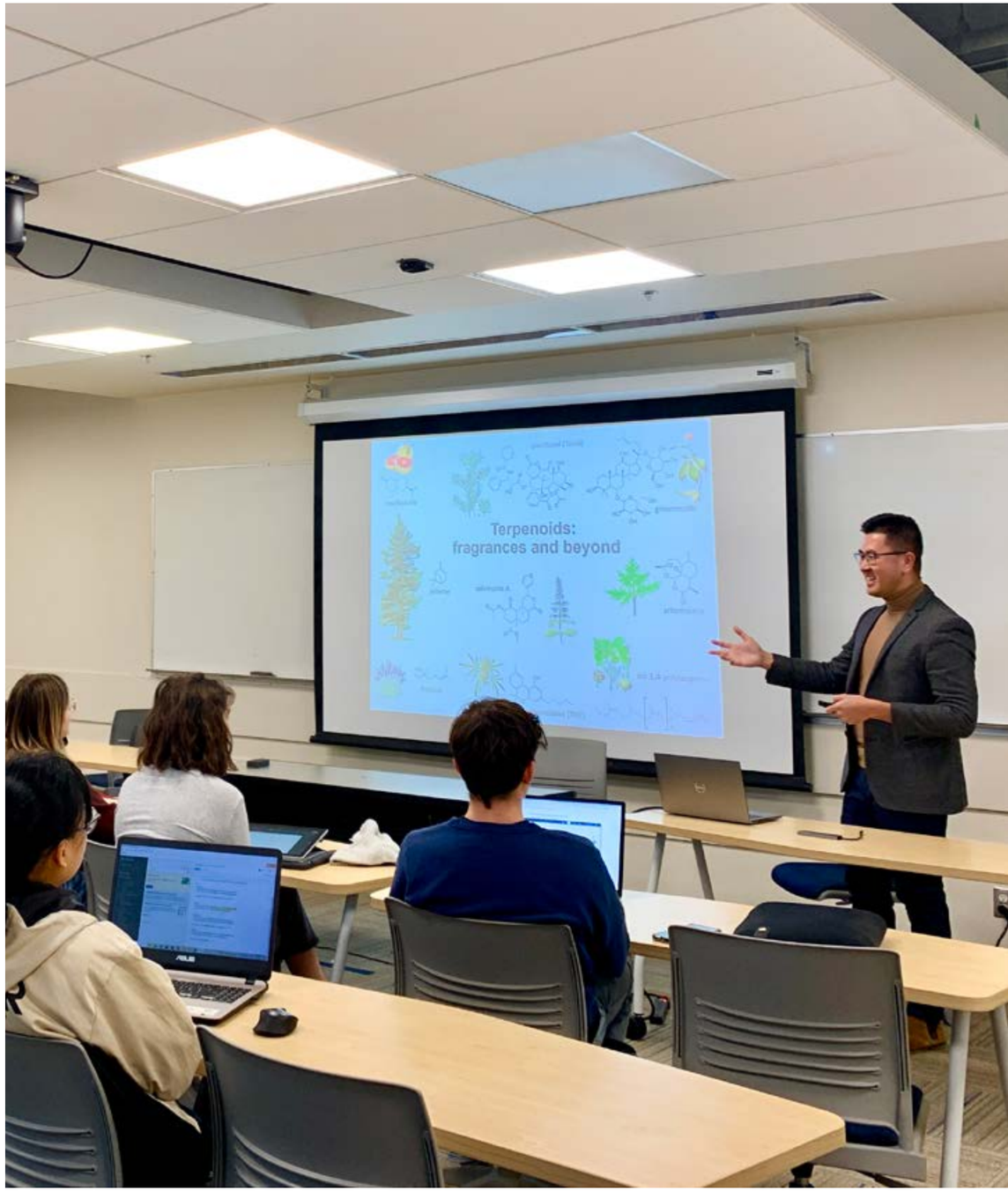
The IKBFoS administrative offices, including the Dean's Office, are housed on ASC level 4. The space formerly was home to administrative offices for the IKBSAS. It continues to be shared with IKBFASS, which was also formed during the restructure in 2020. During the past four years, both Faculties have thrived and grown, which has required expansion of Dean's Office administrative support for the departments that they serve. ASC level 4 is no longer adequate for housing administrative offices of both the IKBFoS and IKBFASS. It is anticipated that one of the two Dean's Offices will relocate in its entirety as part of space backfill related to opening of the ȾSSAAC Building and future downtown building. The latter building will provide 10,000 m² of new academic and research space, which is expected to house a significant portion of the Faculty of Health and Social Development.

The four departments that comprise the IKBFoS each have a main office around which offices for the Department Head and administrative support staff are situated. Laboratory technical staff typically have offices located near the teaching or research labs that they manage. Academic faculty affiliated with each department have offices situated in the ASC, FIP and SCI buildings with individuals generally preferring to be located near their research laboratories, graduate students and post-doctoral researchers.

The majority of BC General Employees' Union (BCGEU) support staff have shared offices located on campus. Management and Professional (M&P) staff typically have single-occupancy offices, but in their most recent Collective Agreement were granted the option of working partially or fully from home. M&P staff who elect to work partially from home commonly share an office on campus to ensure efficient use of space. The UBC Strategic Space Committee recently released guidelines for office allocation and use on campus, which now requires academic faculty to be present for at least three days per week to be assigned a single-occupancy office.

TEACHING SPACE

The majority of lectures for undergraduate courses are taught in centrally managed lecture halls and classrooms. The growth experienced by our campus has led to significant scheduling constraints to accommodate all of our campus teaching needs in these centrally managed and shared teaching spaces, impacting the schedules of IKBFoS faculty and students. Undergraduate teaching space managed by IKBFoS consists primarily of wet and dry laboratories, and associated lab service (preparation and storage) rooms. The Faculty is responsible for administration and upkeep of 12 dry labs (850 m²), and 18 wet labs (1790 m²) for undergraduate teaching. CMPS and EEGS manage the majority of dry labs (450 and 350 m², respectively). BIOL and CHEM have the largest areas of undergraduate wet laboratory space (750 and 900 m², respectively). The quality of undergraduate teaching space is generally high in ASC, FIP and the third floor of SCI. The latter was added to an existing two-story SCI building in 2005 when the UBC Okanagan campus was established. Teaching laboratories located on SCI levels 1 and 2 date from the 1990s and several of those laboratories are in need of renovation to attain a standard more typical of a top-tier Canadian university.



RESEARCH SPACE

The Faculty is responsible for management of 1082 m² of dry and 1747 m² of wet research laboratory space housed within the ASC, FIP and SCI buildings. Those areas represent active laboratory space and do not include adjacent support rooms for technician offices or storage. During the last five years, IKBFoS also has been allocated new research space in the UBCO Plant Growth Facility (PGF; 425 m²) and Innovation Precinct 1 (IP1; 260 m²). The PGF is used primarily by researchers in BIOL and CHEM, and faculty from CMPS mainly have been allocated research space in IP1.

New hires typically are allocated research space within a shared laboratory. Most individuals establish independent research groups using Canada Foundation for Innovation John Evans Leadership (CFI-JELF) funds and their start-up allocation, which also includes matching funds from the UBC Aspire Fund. The typical CFI-JELF allocation for new hires on our campus is $150,000 (total value of $375,000 including BC Knowledge Development Fund match and 20% UBC commitment). Additionally, the Vice-Principal Research and Innovation Office in collaboration with the IKBFoS co-fund two research institutes and three core facilities that are lead or directed by IKBFoS researchers.

The Faculty also has a further 100 m² of unheated space for servicing and storage of research field equipment in a facility known as the "Science Shed" that was constructed through grants awarded to BIOL and EEGS faculty prior to 2005. Researchers in the two departments also manage a fleet of twelve vehicles (SUVs, half-ton and one-ton trucks), two quad-bikes and several boats. The vehicles are kept in a fenced compound in Lot I in the Innovation Precinct. The parking lot also contains two 40-foot sea containers purchased for BIOL and EEGS researchers to store field equipment and samples to ensure research space within campus buildings is used efficiently.

Researchers in the IKBFoS have access to west campus lands for agricultural research. The fields are located below the Plant Growth Facility. Permission to install temporary structures, fencing, etc. for research is requested through the UBC Strategic Space Committee.

UBC Okanagan Research Institutes and Core Facilities* Led by IKBFoS Researchers

Institute or Facility	Overview
Analytics in Medical Sciences (AiMS) Institute	A partnership between UBC Okanagan, BC Cancer, and Interior Health, the Analytics in Medical Sciences (AiMS) Institute is a network of interdisciplinary experts working in medical physics, imaging, engineering, mathematics, oncology, informatics and data analytics. AiMS applies data and science to real-world clinical problems to develop locally relevant and globally impactful advancements in health care.
Okanagan Institute for Biodiversity, Resilience & Ecosystem Services (BRAES)	The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) is a group of over 30 researchers working in ecology, biodiversity and conservation, and environmental sustainability. BRAES has active affiliations with many partner organizations, including government ministries and NGOs around the world, and is committed to promoting research partnerships and carrying out research that will directly inform environmental policy and management decisions.
Fipke Laboratory for Trace Element Research (FiLTER)	FiLTER is a fee for service facility specializing in trace element analysis and electron microscope imaging. The intended users are primarily academic researchers, but the facility is also available for government and industry research. The lab was formed from an investment from the Government of Canada through PacifiCan and generous donations from UBC alumnus Charles E. Fipke.
Animal Care Facility	
Plant Growth Facility	The Plant Growth Facility on UBC's Okanagan campus is a state-of-the-art greenhouse that opened in September, 2020. This 5,000 square foot facility has computer-controlled light and temperature programs. Four separate rooms within the glasshouse provide ample space for large projects, and allow for isolation of different growth and treatment protocols. In addition, two walk-in growth chambers allow for plants to be exposed to temperatures as low as +5°C.

* Institutes and core facilities are supported jointly by the IKBFoS and Vice-Principal Research and Innovation Office. The FiLTER laboratory also receives financial support from the SoE.

IKBFoS researchers are also affiliated with additional centres and institutes on the UBCO campus.

ǰəl sic snpaǰnwixʷtn (ǰssaac) building

The ǰssaac building scheduled to open in March 2026 will provide significant new research, teaching and office space on the UBC Okanagan campus. The building is intended to bring together diverse fields of knowledge and perspectives. That goal is reflected in the name ǰəl sic snpaǰnwixʷtn, which was gifted to UBC by Syilx Okanagan, meaning 'a place to innovate through enlightening and informing one another'. The building will house the Interior Salishan Studies Centre and provide diverse learning, research and gathering spaces for collaborative and interdisciplinary research.

Research space was allocated in ǰssaac on a competitive basis through a two-stage process managed by the offices of the Vice-Principal Research and Innovation, and the Provost and Vice-President Academic. IKBFoS researchers lead or co-lead several applications. (See Appendix I, Proposed Research Hubs in ǰssaac Building)

A campus-wide process is underway to catalogue and re-allocate space that will become available as a result of faculty relocating to new laboratories and offices in ǰssaac. The IKBFoS expects to address ongoing space shortages as part of the ǰssaac backfill process. We are unable to provide new hires with a single-occupancy office after July 2025 until ǰssaac opens in March 2026. Our ability to meet space needs beyond March 2026 relies upon the Faculty retaining a substantive proportion of the space that it presently occupies in addition to the space in ǰssaac that has been allocated to IKBFoS researchers.

9.0

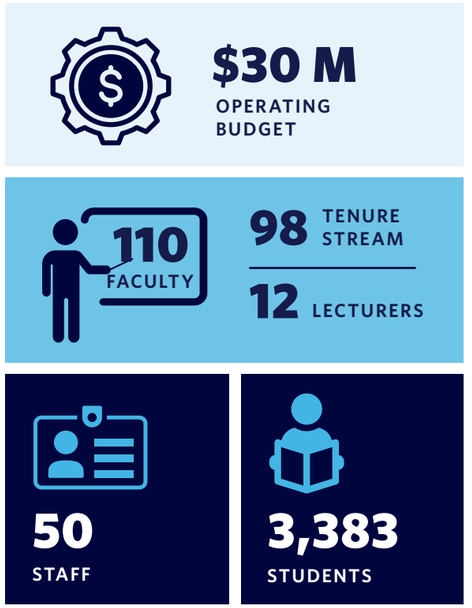
FINANCIAL PLANNING AND RESOURCES

Budget Model Overview

IKBFoS has multiple funding sources, including tuition dollars (graduate, undergraduate and professional programs), government funding (seat and general wage increase (GWI)), research funding (government and industry sources), micro-credential revenues, and endowments and gifts.

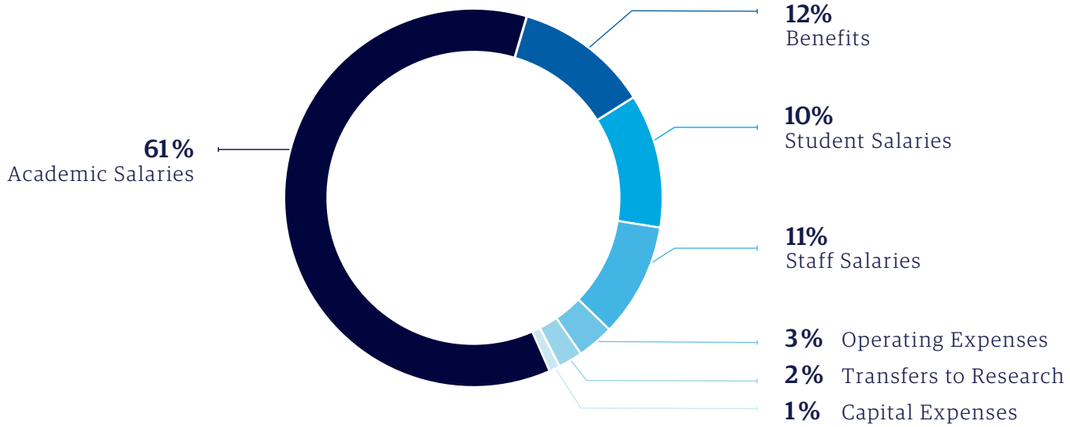
The Operating Budget

BUDGET QUICK FACTS

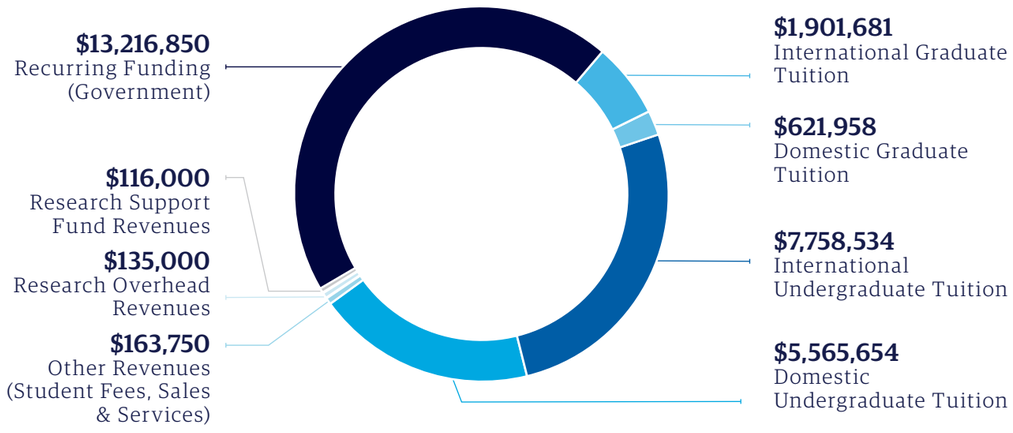


2023/24

IKBFoS Expense Allocation



IKBFoS Revenue Allocation**



Numbers taken from the FY25 approved budget

**Total revenue does not tie directly to F25 plan total, due to one-time funding (OTF) offsets included in the plan (ie. Research Finance staff contribution). These OTF act as outflows that offset revenue numbers.

The $30 million operating budget is planned to be spent in each fiscal year to support graduate and undergraduate student training, course delivery, and research activities within IKBFoS. For the past several years, international student numbers have increased in the Faculty, which has resulted in a carryforward reserve in IKBFoS of ~$4 million for the FY25 year, beginning April 1, 2024. The large majority of expenses supported by the operating budget are faculty salaries, followed by staff salaries, benefits and student salaries. Total salary and benefits make up 94% of the Faculty's ongoing operating budget expenses. The campus budget supports building costs, library, IT, Office of research services, student services, athletics and other items not borne by the Faculty. Centralization of these services creates efficiencies on the Okanagan Campus. These services are funded by tuition dollars (Faculties receive a portion and central UBCO receives a portion).

IKBFoS Faculty and Staff Headcount Report (2020 – 2023)

		2020/21	2021/22	2022/23	2023/24
Tenure Stream Faculty	Full Professor	30	31	29	28
	Associate Professor	31	34	33	32
	Assistant Professor	17	21	22	24
	Professor of Teaching	-	1	1	1
	Associate Prof. of Teaching	8	8	8	8
	Assistant Prof. of Teaching	4	4	4	5
		90	**99**	**97**	**98**
Non-Tenured Faculty	Lecturer	5	6	9	12
	Sessional Lecturer	16	20	14	17
	Assistant Professor w/o review	2	1	1	-
	Assistant Prof. of Teaching w/o review	1	-	-	-
	Adjunct Faculty	-	-	1	1
		24	**27**	**25**	**30**
Staff	Clerical, Secretarial & Library Assistants	3	17	24	22
	Management & Professional	12	11	14	18
	Trades, Service & Technical	33	16	18	14
		48	**44**	**56**	**54**
Total		**182**	**195**	**202**	**211**

BUDGET FORECAST

In July 2024 (Q1 FY25), the Faculty is forecasting a small deficit for the current year. Carryforward will be used to cover any deficit realized by the Faculty in FY25.

The shifting political landscape and uncertain enrollment numbers makes financial planning beyond FY25 extremely difficult. Faculty revenues from domestic tuition and government funding are not expected to increase in the foreseeable future, leaving the IKBFoS in a situation where additional revenue streams are required to sustain our core activities.

In 2020 and 2021, IKBFoS saw a large increase in the number of international students taking the BSc degree. This number declined in 2022 and 2023. In 2024, the forecasted number of international students is the lowest since before 2018, which is largely due to the international and geopolitical landscape affecting all Canadian Universities, and is not specific to IKBFoS. With international student tuition being a large revenue driver in the budget, our smallest cohort in seven years will have budgetary implications. This is especially true as the larger cohort sizes graduate from their four-year programs, and we move into reduced overall international student numbers in the Faculty.

As we move into a declining budgetary environment, leadership is evaluating options and moving ahead carefully with all decision making.

IKBFoS New to Program (NTP) International Students

BSc-O International	
2018	143
2019	149
2020	218
2021	217
2022	155
2023	165
2024 (Fcst)	131

Measures taken in FY25

- **Course Offerings** – Sessional teaching budgets have been held flat; departments are reviewing course offerings.
- **Graduate Student Support** – TA budgets have been held flat; graduate programs are asked to ensure incoming students have appropriate funding from other sources (i.e., research grants) before admitting.
- **Operating & Capital** – Budgets have been held flat this year.
- **Hiring** – Continue to proceed cautiously with all hiring decisions. All planned future faculty hires must be approved by the Leadership Team before going forward to Provostial Hiring Review (including replacements).

ENDOWMENTS & GIFTS

Irving K. Barber Endowment Fund: this endowment is shared between the IKBFASS and the IKBFoS. Each Faculty receives $200,000 in annual revenues to support the student experience.

Watershed Endowment: the Department of EEGS receives an annual revenue of $225,000 from this endowment to support Watershed programming, as well as the salary for the chair, and a partial salary for a staff member.

The IKBFoS also receives financial support through various community partnerships and philanthropic organizations.

RESEARCH REVENUES

In 2023/24, IKBFoS faculty members brought in $9.952 million in research funding over 272 projects. This is the second-highest level of research funding to a Faculty at UBCO. The Faculty aspires to provide adequate levels of administrative support to research grant holders, in collaboration with central services such as the Office of Research Services and Finance. This support is provided in part from indirect cost recovery, or research overhead.

The IKBFoS received research support fund and research overhead revenues of $333,000 in 2023/24. These revenues contribute to salary supports for two Finance Staff, one Research Finance Analyst, three research technicians (for the BRAES research labs, the FiLTER labs, and the Plant Growth Facility), and three Graduate Program Assistants who provide support services for researchers in the Faculty. In addition, the Associate Dean of Research has an annual operating budget to support research activities in the Faculty, through department research support, faculty member grant application matching commitments, travel funds, start-up funds for new faculty members, post-doc supports, backstops for CFI's (loans) and other research activities. The cost of supporting research activity over the past years has far surpassed the revenues received from research overhead.

10.0

FUTURE DEVELOPMENT

The IKBFoS, formerly part of the IKBSAS, was created when the school transitioned to two autonomous Faculties on July 1, 2020. In a few short years we have made enormous progress towards identifying and building our Faculty strengths in teaching, learning, and research. The transition to two Faculties, followed by the prolonged disruptions of the COVID-19 pandemic, and then interim leadership, means we have not yet engaged in a Faculty-wide strategic planning and visioning process.

By providing a summary of the current state of the Faculty, the present document will be invaluable to informing the strategic planning process over the coming year, and suggestions for future direction made below are meant as a starting point to guide discussions.

Central to the Faculty strategic planning process will be the question of growth, and this should be considered in light of the aspirations of the Okanagan Campus 2040 plan, and of the current fiscal and university climate. The plan will need to articulate growth targets, and pathways for enabling the Faculty to achieve its goals through revenue generation, infrastructure development, and investments in people and community. With this in mind, there are a few imperatives that follow, which we believe should underlie any future directions in the Faculty for the next five years and beyond.

COLLABORATION

As a Faculty, we can accomplish so much more by leveraging collaborations and partnerships within the campus, the University, and our broader community. We should continue to build relationships and seek opportunities for synergies and efficiencies with other Faculties and community partners in offering academic programs and building research clusters. Recent examples include our partnership with BC Cancer, the creation of the dual-campus Centre for Wildfire Coexistence with the Faculty of Forestry, and the emerging collaboration between Computer Science in IKBFoS and Computer Engineering in the Faculty of Applied Science. Future development might include creation of informal or formal structures to increase the visibility and impact of program offerings in sustainability, computing, and life sciences.

ENHANCE EXISTING AREAS OF STRENGTH IN RESEARCH

Any faculty-hiring decisions should be made strategically to enhance existing areas of strength in research and educational leadership, to build clusters of critical mass, and to optimize infrastructure investments. This will have the added benefits of increasing the national and international impact and visibility of the Faculty's research expertise, leveraging infrastructure, and creating community. This is particularly important given the significant research infrastructure investments that have been made on campus in recent years, and that are in progress. We are currently planning strategic deployment of two Canada Research Chairs in the Faculty to the themes of climate resilience and artificial intelligence, and recent hires in Earth and Environmental Sciences have created a core cluster of principal investigators using the Fipke Laboratory for Trace Element Research (FiLTER Lab). Additional opportunities exist to build on infrastructure and shared laboratory facilities, particularly in the life sciences for the agriculture and human health pillar, in the xʷəl sic snpaxʷnwixʷtn building, the Plant Growth Facility, and the West Campus Lands.

DIVERSIFICATION OF LEARNING OPPORTUNITIES

As part of our core mission of service to society, the university of the future will need to serve a broader base of learners and provide an experience that remains relevant and valuable in an age of readily accessible information, online learning resources, and artificial intelligence.

Continuing and Professional Education

As described in *Section 2.3*, through Continuing and Professional Education offerings, our Faculty aspires to reach learners coming from varied backgrounds and career experiences, providing opportunities for lifelong learning. We plan to expand our activities in this area by building on and enhancing our successful model of offering non-credit programs, with several certificates currently in progress. We also have plans to ladder from the certificate programs to develop credit-based, professional master's programs that meet labour market demands. In all cases, these program offerings will logically reflect our core academic strengths, and many of these programs can be developed in partnership with other Faculties within UBC.

Undergraduate Learning Experiences

The expertise of our Educational Leadership faculty members can be leveraged to help us envision the future of undergraduate education in a world of AI and online educational resources. Enhancing experiential learning opportunities is a core goal for the UBC Okanagan campus and is a founding principle of the IKBFoS. The Faculty could greatly increase its lab- and field-based courses, including summer school offerings that take advantage of the Okanagan location. These ideas and others are currently being explored in our curriculum portfolio, and form part of a campus-wide leadership discussion about the future of university education and academic priorities for the UBC Okanagan campus.

CONCLUDING REMARKS

None of our goals can be accomplished without a strong Faculty culture. Our commitment to creating a safe, welcoming and inclusive workplace needs to be continually upheld and maintained. Supporting career development for all staff and faculty, ensuring adequate representation of designated groups in leadership, faculty and staff positions, and building a sense of community are fundamental to the success of a small campus and of our Faculty.

We look forward to working together to envision and co-create our future IKBFoS as a place of excellence in learning, research and teaching.

THE UNIVERSITY OF BRITISH COLUMBIA

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Okanagan Campus

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