THE
UNIVERSITY OF
BRITISH COLUMBIA

Faculty of Land and Food Systems

Master Program for H.R. MacMillan Building

Resource Planning Group Inc.

August 6, 2019

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H.R, MacMillan Building

RPG – Resource Planning Group Inc.

Vancouver, British Columbia
August 6, 2019

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SECTION 1: INTRODUCTION, KEY PARAMETERS, AND SUMMARIES

INTRODUCTION

PURPOSE OF THE MASTER PROGRAM

The Master Program provides preliminary information that will guide project definition and future design work for the Faculty of Land and Food Systems (LFS) spaces and functions within the H.R. MacMillan Building which would be based in a renewed or replacement building. As preliminary information, more detailed planning may be required during design.

The intent of this document is to develop sufficient programmatic information to inform decisions about the reuse or replacement of MacMillan Building by LFS and to initiate detailed programming, planning and design processes. Projected functional requirements are based on estimates for the 2023/24 academic year. Additional review and further development will be required during later stages of project definition and design.

DESCRIPTION OF THE WORK PERFORMED

RPG began work on the LFS H.R. MacMillan Functions in October 2018. An initial meeting was held with the Project Steering Committee on October 5 followed by meetings with User Advisory Groups in the following two weeks. Near the end of this period, RPG received completed survey information which identified current and projected student enrollments, faculty and staffing, and research lab needs. A draft document was developed and released for review and comment the week of November 19. RPG met with the Project Steering Committee to review the document on December 7. Further instructions were received by RPG on January 7 and a second draft was issued on January 16, 2019 for final review with User Advisory Groups (UAGs) at the end of January and in early February 2019. A list of outstanding questions was sent on February 1, 2019 to LFS. Responses were received on March 23, 2019 and incorporated into the final document.

Final draft Land and Food Systems H. R. MacMillan Functions Master Program was submitted April 12, 2019. During April and May final edits were received and the final document was submitted in August 2019.

ORGANIZATION OF THE REPORT

This document includes the major sections indicated below:

- INTRODUCTION, KEY PARAMETERS AND SPACE SUMMARY, which includes, in the Introduction, a brief outline of the project, a description of work performed, and participants summary; Key Parameters, which briefly describe the project as a whole, and the anticipated role and scope of activities for the LFS in the H.R. MacMillan Building, and space requirements summary;

- COMPONENT PLANNING CRITERIA, which translates the expected functional parameters and role and scope of services of the project into a brief description of activities, factors determining size, locational requirements, and space estimates; and
- APPENDICES, which provides supporting documents relevant to the report, including Definitions of Terms.

PARTICIPANTS

For reference, the list below includes the LFS representatives that participated in developing the Master Program.

<u>LFS Executive/Steering Committee</u>

Barbara Hsiao, Director, Human Resources and Administration
Andy Jeffries, Faculty Operations Manager
David Kitts, Associate Dean, Research
Christine Scaman, Associate Dean, Academic, FNH
Zhaoming Xu, Program Director, FNH
Rickey Yada, Dean, LFS
Ava Yang, Senior Finance Manager
Barbara Gordon, UBC Facilities Planning, Senior Planner

<u>Advisory User Groups</u>

Classrooms, Informal Learning Spaces
Sandra Brown, Instructor, APBI
Chloe Jung, Program Advisor, MLWS
Les Lavkulich, Director, Global Resource Systems, Director MLWS
Christine Scaman, Associate Dean, Academic, FNH
Kelleen Wiseman, Director, MFRE
Zhaoming Xu, Program Director, FNH
Barbara Gordon, UBC Facilities Planning, Senior Planner
Jodi Scott, UBC Facilities Planning, Senior Planner – Learning Spaces

Undergraduate Teaching Labs
Sandra Brown, Instructor, APBI
Imelda Cheung, Education & Research Support Technician, FNH

Lesley Dampier, Teaching and Research Support Technician, APBI
Patricia Hingston, Instructor, FNH
Maja Krzic, Associate Professor, LFS Soils
Christine Scaman, Associate Dean, Academic
Barbara Gordon, UBC Facilities Planning, Senior Planner

Research Labs
Andrew Black, Professor, LFS Biometeorology Group
Simone Castellarin, Associate Professor, APBI
Sue Grayston, Program Director, APBI, Professor, LFS and Forestry
Sean Smulker, Assistant Professor, APBI
Barbara Stefanska, Assistant Professor, FNH
Jim Thompson, Professor/Director, Dairy Education and Research Centre
Nina von Keyserlingk, Professor, Animal Welfare Program
Zhaoming Xu, Program Director, FNH
Barbara Gordon, UBC Facilities Planning, Senior Planner

Pilot Plant
John Frostad, Assistant Professor, FNH
Peter Hoffman, Research Lab Technician, FNH
Azita Madadi-Noei, Lecturer, FNH
Anubhav Singh, Assistant Professor, FNH
Barbara Gordon, UBC Facilities Planning, Senior Planner

Student Services
Rob Kim, Career Strategist, LFS
Christine Klaray, Director, Student Services, LFS
Joel Liman, Senior Advisor & Recruiter – Indigenous Students
Cyprien Lomas, Assistant Dean, Learning Technologies/Director, LFS Learning Centre
Roxana Quinde, Program Coordinator, Global Resource Systems (GRS)
Christine Scaman, Associate Dean, Academic, FNH
Edmund Seow, Computer Systems Manager, LFS
Barbara Gordon, UBC Facilities Planning, Senior Planner

Student Life – Undergraduate Students
Christine Klaray, Director, Student Services, LFS
Emma Rowbotham, Student Engagement Officer
Barbara Gordon, UBC Facilities Planning, Senior Planner

Student Life – Graduate Students
Lia Maria Dragan, Graduate Programs
George Kennedy, MFRE
Les Lavkulich, Director Global Resource Systems, Director MLWS
Dan Naidu, Graduate Programs
Zhaoming Xu, Program Director, FNH
Barbara Gordon, UBC Facilities Planning, Senior Planner

Administration and Faculty Offices

Pedro Aloise, Operations Manager, LFS (retired)
Elena Donskikh, Finance Coordinator, LFS
Niki Glenning, Alumni Relations Manager, LFS
Barbara Hsiao, Director, Human Resources and Administration
Andy Jeffries, Faculty Operations Manager
Melanie Kuxdorf, Communications and Marketing Manager, LFS
Chris McGill, Program Manager, Animal Welfare and APBI
Lisa Rooney, Administration Manager, FNH/WRC
Edmund Seow, Computer Systems Manager, LFS
Barbara Gordon, UBC Facilities Planning, Senior Planner

UBC Facilities Planning

Barbara Gordon, Senior Planner
Jodi Scott, Senior Planner – Learning Spaces

RPG - Resource Planning Group Inc.

Mark Mehrer, Senior Principal
Sherri Slobodian, Technical Support

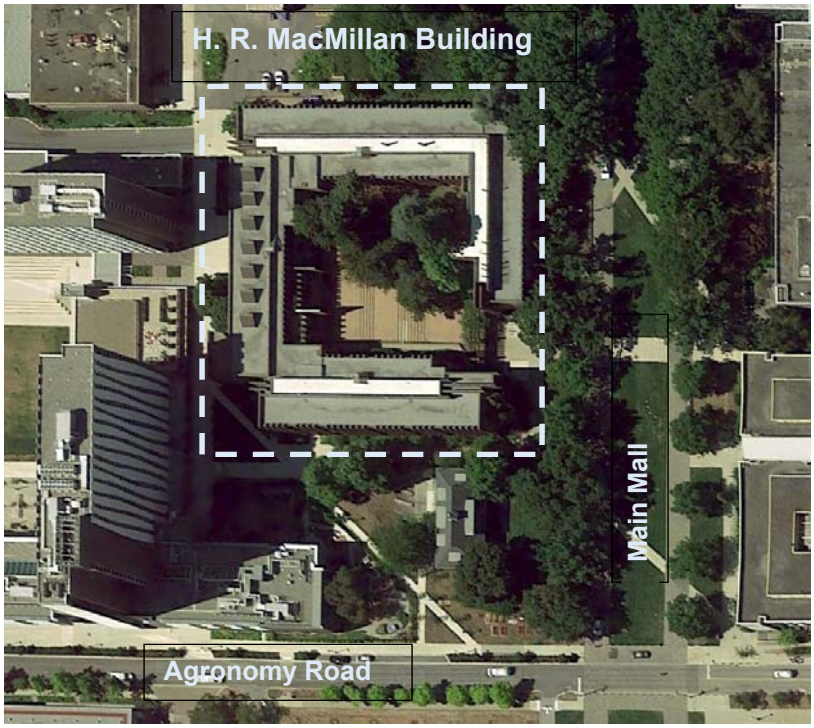
KEY PARAMETERS

SCOPE OF THE PROJECT

The Faculty of LFS is accommodated within a number of facilities at UBC's Point Grey Campus, with standard teaching, research and administrative activities accommodated within the H.R. MacMillan Building, which serves as the administrative base for the Faculty, and the Food, Nutrition and Health Building. Other Faculty activities are accommodated at the Point Grey Campus, including the Horticulture Greenhouse and UBC Farm, and at the UBC Dairy Centre in Agassiz.

This project includes a review of the space requirements for the Faculty of LFS activities that are currently accommodated within the H.R. MacMillan Building as well as LFS' Pilot Plant currently located in temporary space in the Wesbrook Building.

While the MacMillan Building is primarily occupied by LFS, Floor Levels 2 and 3 of the South Wing are also occupied by the Faculty of Applied Science. Floor Levels 1 and 2 of the Centre Wing include a number of general use classrooms, and Floor Level 3 includes informal learning spaces (Learning Commons), in the former MacMillan Library space.



MacMillan Building was constructed in 1967. Many building systems and finishes are at the end of their serviceable life. Concurrent investigations around issues and costs associated with renovating the MacMillan Building are being conducted as this Master Program is being developed. As such, the Master Program information is intended to identify the ideal requirements of LFS activities that are currently

located within MacMillan Building. No attempt has been made to align existing space used by LFS within MacMillan with the space requirements developed in this Master Program.

As this Master Program information is reviewed or utilized in subsequent design processes, it should be noted that existing office sizes are generally larger than the standard sizes identified in this document. If the project is a renovation of MacMillan, building conditions may have an impact on whether the office sizes identified in the Master Program can be achieved.

LAND AND FOOD SYSTEMS STRATEGIC DIRECTIONS

Mission Statement

The UBC Faculty of Land and Food Systems uses student-centered learning to educate new generations of scientists equipped to solve the most fundamental issues faced by society — those focused around human health, a sustainable food supply and the responsible use of finite land and water resources. To that end, Faculty initiatives foster and support research excellence, innovative active learning environments, strong community connections, and global and local collaborations.[1]

Vision

The Faculty of Land and Food Systems is a world leader in integrated research, education and service to address critical global issues around human health, and a sustainable food supply.

Priorities

The project will assist in meeting the following LFS stated Priorities identified in the Faculty's *Action Plan 2016-2020*:

Teaching, Student Learning and Engagement

- Enhance the quality and impact of teaching and programs for all students;
- Strengthen efforts to promote and support student success;
- Recruit top students and improve student retention; and
- Support student well-being, personal development, and outstanding campus life.

[1] *From UBC Faculty of Land and Food Systems website*.

Research Innovation and Excellence

- Build and capitalize on the strengths of our researchers as well as our research and teaching centres;
- Support and enhance grant funding competitiveness and success;
- Foster greater inter-LFS collaboration among faculty members as well as collaborations with UBC, Canadian, and international researchers; and
- Build Faculty capacity through infrastructure development.

Community Engagement

- Build a sustainable alumni and community engagement and commitment to LFS by expanding opportunities for lifelong engagement;
- Establish a sustainable fundraising program for annual goals and build strong development partnerships; and
- Increase understanding and awareness of the Faculty of Land and food Systems.

Outstanding Work Environment

- Ensure a work environment that fulfills employees' needs for continual learning and growth leading to increased employee satisfaction;
- Recognize and reward outstanding staff and faculty members;
- Create a strong team of staff so support Faculty goals; and
- Streamline committees and reporting systems, and establish LFS policies and procedures.

Planning Horizon for the Project

Master Programming has been based on estimated future activities as best understood by LFS representatives for the current (year 2018/19) and estimated future 'planning horizon' (year 2023/24).

ENROLLMENTS AND PROGRAMS SUMMARY

This section provides a summary of key assumptions driving the project.

The Faculty of LFS is anticipating that some program areas will see significant growth and that other program areas will see modest growth, with an overall increase in student enrollments of approximately 18%.

Undergraduate Programs

Most of the undergraduate enrollment growth is focused on Applied Biology, Forestry and Global Resource Systems streams as well as a new BSc stream in Food and Resource Economics.

The Faculty offers a Land One program jointly with the Faculty of Forestry. Land One is a cohort-based program with an integrated format that focuses on issues and real world cases, such as climate change, food security, land use and sustainability. It is anticipated that in the future one-quarter of all first year students will be in the Land One program stream. Currently, scheduled instruction is accommodated in Forestry and the lounge space within the MacMillan Building.

Service courses are limited to APBI 200 supporting Forestry students.

In addition, a number of the courses are cross listed, including cross listed courses with the Faculty of Science (Biology [incl. BIOL/APBI 210, 324, 327, 364, 421, and 440], Geographical Sciences, and Computational Intelligence and Design) and the Faculty of Forestry (Conservation).

Graduate Programs

Research oriented graduate programs currently have an enrollment of 121 student FTEs. This will increase to 146.0 student FTEs in the future, primarily as more PhD students are expected.

The Faculty currently offers three Professional Masters programs which have a combined enrollment of 88.0 student FTEs.

Two new Professional Masters programs have been identified for the next five years. It is assumed these programs will follow current PM models, with cohort-oriented, course and project-based programs that are completed within one calendar year.

Students in Professional Masters programs will be based in specific program spaces and do not require any other assigned desks or space in research labs.

Pedagogy

The Faculty makes significant use of problem based learning modalities, necessitating need for smaller breakout spaces for tutorials and small group discussion. Some of these may be associated with larger tiered classrooms, but others should be located with the classrooms to facilitate use during scheduled classes.

The Faculty has stressed the need for flexibility within instructional spaces to support the wide range of pedagogy used by faculty, lecturers, and instructors.

The following table summarizes program growth for the Faculty of Land and Food Systems, including programs delivered in the Food, Nutrition and Health Building.

Existing and Future Workloads (Student FTEs)

LFS Program		Existing 2018/19	Future 2023/24	Net Difference
Undergraduate				
BSc - Applied Biology	Yr 1 – 4	393.0	524.0	131.0
BSc - Food, Nutrition and Health	Yr 1 – 4	880.0	918.0	38.0
BSc - Global Resource Systems	Yr 2 – 4	94.0	122.0	28.0
BSc - Food & Resource Economics	Yr 1 – 4	-	15.0	15.0
Service Courses - APBI 200		23.2	25.0	1.8
Subtotal		1,390.2	1,604.0	213.8
Graduate				
MSc – Research*		60.0	67.0	7.0
PhD – Research*		61.0	79.0	18.0
MFRE (Food and Resource Economics)		36.0	50.0	14.0
MLWS (Land and Water Systems)		18.0	30.0	12.0
MFS (Food Systems)		34.0	40.0	6.0
New Professional Program 1		-	15.0	15.0
New Professional Program 2**		-	15.0	15.0
Subtotal		209.0	296.0	87.0
Total		1,599.2	1,900.0	290.8

* Number includes all LFS graduate students. In the future approximately 70-80% of LFS research graduate students will be accommodated in MCML.

** Will be delivered from Food, Nutrition and Health Building.

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SPACE SUMMARY

The following tables summarize LFS existing space inventory within the MacMillan Building and preliminary projected space requirements to 2023/24. Existing space is indicated in terms of net square metres (NSM)[2] and does not include general use classrooms, or general informal study space, such as Room 360. Preliminary projected space requirements are indicated in terms of NSM, component gross square metres (CGSM)[3], and building gross square metres (BGSM)[4]. Details of the existing inventory are provided in *Appendix B – Inventory Review*.

EXISTING INVENTORY

Component	1.0 Class-rooms	2.0 Teaching Labs – UGrad	3.0 Research Labs	4.0 Academic & Admin Offices & Related Support	14.0 Common Use & Student Activity	16.0 Non-Assignable	Total - NSM
A. Classrooms, Teaching Labs, Undergraduate Student Support, Informal Learning	84.2	771.7	-	-	434.0	-	1,289.9
B. Research Labs, Research Support and Professional Masters Programs	-	-	1,845.4	-	-	-	1,845.4
C. Academic & Administrative Offices & Related Support	-	-	-	1,974.0	-	-	1,974.0
D. Building Services & End-of-Trip Facilities	-	-	-	-	229.7	19.3	249.0
Total NSM	**84.2**	**771.7**	**1,845.4**	**1,974.0**	**663.7**	**19.3**	**5,358.3**

[2] *NSM: horizontal area of space that is assignable to a specific function. Net areas of rooms are measured to the inside face of wall surfaces.*

[3] *CGSM: portion of a building assigned to a specific component/department but including only the net assignable areas plus internal component circulation (such as corridors), partitions, and small plumbing shafts. General circulation, mechanical rooms, electrical rooms, and exterior wall thicknesses are excluded from this measurement.*

[4] *BGSM – calculated by multiplying total of CGSM areas X 1.65. The building Gross up is the difference between total NSM and BGSM; it accommodates general circulation, entrance vestibules, elevator shafts, staircases, mechanical and electrical rooms, exterior wall thicknesses, washrooms, etc. This is included for reference only, to reflect the implications of the project as new construction.*

PRELIMINARY SPACE REQUIREMENTS

Preliminary space requirements for LFS are summarized in the following table and are based on projected activities for the year 2023/24 as detailed in Section 2 of this document.

Projected Space Requirements (2023/24)

Component	1.0 Class-rooms	2.0 Teaching Labs – UGrad	3.0 Research Labs	4.0 Academic & Admin Offices & Related Support	14.0 Common Use & Student Activity	16.0 Non-Assign-able	**Total NSM**	*Estimated Component Gross-up Factor*	Est. CGSM	**Est. BGSM**
A. Classrooms, Teaching Labs, Undergraduate Student Support, Informal Learning Space (excl. Classrooms)	-	626.1	-	22.0	581.5	-	**1,229.6**	*1.20*	1,475	**-**
B. Research Labs, Research Support and Professional Masters Programs	-	-	1,869.8	792.6	237.5	-	**2,899.9**	*1.15*	3,325	**-**
C. Academic & Administrative Offices & Related Support	-	-	-	1,167.5	-	-	**1,167.5**	*1.35*	1,575	**-**
D. Building Services & End-of-Trip Facilities	-	-	-	-	-	147.6	**147.6**	*1.10*	160	**-**
Subtotal NSM (Except Classrooms	-	626.1	1,869.8	1,982.1	819.0	147.6	**5,444.6**	*1.20*	6,535	**-**
Subtotal - BGSM (If New Construction: BGSM@1.65 X NSM)										**8,985**
A. Classrooms	1,467.9	-	-	-	-	-	**1,467.9**	*1.05*	1,540	**-**
Subtotal BGSM (If New Construction: BGSM@1.65 X NSM)										**2,420**
Total - BGSM If New Construction	**1,467.9**	**626.1**	**1,869.8**	**1,982.1**	**819.0**	**147.6**	**6,912.5**		**8,075**	**11,405**

Qualifications and assumptions to consider when reviewing the preliminary space requirements table above include:

- Classrooms: Classrooms are considered as part of an overall precinct strategy with requirements reviewed to ensure they comply with current UBC guidelines and the capacity and space requirements of LFS and UBC.
- Total Area: No attempt has been made to match total preliminary space requirements with total existing area. A number of factors reduce the validity of comparisons, including:
  - Office Size: Current office sizes in the MacMillan Building are generally larger than the standard office sizes used in the Master Program. If the project includes renovations, floorplate, structural and window modules may result in

offices that vary from the standard sizes identified in the Master Program. The design team should be aware of this difference when mapping out areas; and

- Research Graduate Students: Research graduate students and post-doctoral fellows have been allocated a 1.5m X 0.6m desk, which varies from the range of desks and desk sizes currently utilized.

MEETING ROOM SUMMARY

The following table provides a summary of meeting rooms provided in the Master Program.

Component	Ref	Space Name
A. Classrooms, Teaching Labs, Undergraduate Student Support and Informal Learning Space	30	Break-Out/Group Study: 11 @ 10 people*
	32	Land One Base: 1 at 30
B. Research Labs, Research Lab Support and Professional Masters Programs	26	Research Lab, Animal Welfare: 2 meeting tables for 6-8 each
	27	Research Lab, Centre for Sustainable Food Systems: 2 meeting tables for 6-8 each
	28	Graduate/Research Commons: 4 units each with meeting space for 6
	33	Meeting/Phone/Skype Room: 1 with 4 seats
	35	MFRE Cohort Room: 1 for 40
	36	MLWS Cohort Room: 1 for 30
	37	New Professional Masters Cohort Room: 1 for 15
C. Academic and Administrative Offices and Related Support	11	Meeting Room (as part of Learning Centre): 1 for 4 people
	28	Meeting Room, 15-Seat, Shared: 2 rooms
	29	Seminar/Multipurpose Room: 1 room for 25
	31	Meeting Room, 6-Seat, Shared: 2 rooms

* Should be reviewed in next phase of project development.

SECTION 2:
COMPONENT PLANNING CRITERIA

INTRODUCTION

The Component Planning Criteria section includes brief descriptions of Faculty of LFS activities and functional requirements anticipated to be located in the MacMillan Building. Functional requirements are based on estimated enrollments, faculty and staffing provided by the Faculty. Information is preliminary and intended to guide project definition. More detailed planning and revisions may be required as the project moves into the design phase.

The basic "building block" for planning facilities is the **functional component**. A functional component can be defined as a cohesive grouping of activities and assigned spaces, which are related by service or physical arrangement. Functional components include:

A. Classrooms, Teaching Labs, Undergraduate Student Support, Informal Learning Space;

B. Research Labs, Research Lab Support and Professional Masters Programs;

C. Academic and Administrative Offices and Related Support; and

D. Building Services and End of Trip Facilities.

Each component includes information under the following headings:

Brief narrative description, which highlights key planning considerations that are relevant to the component;

Factors determining size, based on the 2023/24 planning horizon of the Master Plan;

Locational criteria, highlighting other components and features that should be proximate, or other locational criteria; and

Preliminary space requirements providing a list of spaces required to accommodate 2023/24 component activities. Included are the name of the room or space, the number of rooms or spaces (units), the net square metres per unit (nsm/unit), the total net square metres for each room or space (nsm), and any supplemental remarks.

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A. CLASSROOMS, TEACHING LABS, UNDERGRADUATE STUDENT SUPPORT, AND INFORMAL LEARNING SPACE

This component accommodates the following functions:

- Scheduled instruction of the Faculty of LFS courses in classrooms, tutorial rooms, and teaching labs;
- Informal Learning space (ILS); and
- LFS Undergraduate Society.

FACTORS DETERMINING SIZE

Subject to future review by LFS, the following summarizes key assumptions and workload inputs related to this component.

Section Hours and Room Requirements

The following tables summarize future (year 2023/24) lecture and tutorial, and teaching laboratory section hours for each of the Fall (W1) and Winter (W2) terms, summarized in terms of section sizes. These tables are summaries of detailed workload information included in Appendix D, which were provided by LFS representatives. In addition, these tables include estimates of the number of required rooms and seat capacities.

Classrooms

For the purposes of the Master Program, for lectures and most tutorials requiring classroom type space, and in order to estimate the number of required classrooms and seat capacities, a maximum classroom time utilization rate assumes a 45-hour week (up to 9 scheduled classroom hours per day, Monday to Friday) and an 80% factor to allow for scheduling inefficiencies. These assumptions result in a maximum scheduled room utilization of 36 hours per week (45 hrs x 80% = 36 hrs).

The table on the following page summarizes LFS classroom needs by capacity, and includes all undergraduate and graduate courses taught by LFS as well as cross-listed courses. It also includes courses offered in other buildings within the precinct. As such the information needs to take into account the other available classrooms within the precinct.

In some cases, the use of an Active Learning classroom was identified as a specific preference. These have been grouped with the respective classroom sizes.

Breakout room needs have been identified separately. A number of courses make extensive use of breakout rooms, with FNH 313 requiring use of 11 breakout rooms concurrently at this time. In the future, this may be accommodated through use of Active Learning/flexible classrooms. The need to support this type of activity and strategies for how this need can be accommodated should be explored in subsequent phases of project development.

The Graduate scheduled hour calculation assumes that the new Professional Masters program will require access to a classroom that accommodates up to 20 students 15 hours per week.

Lecture/Tutorial	No. Seats	Scheduled Section Hrs per Fall	Scheduled Section Hrs per Winter	Proposed Number of Fall	Proposed Number of Winter	MCML	FNH	Other Buiidings
Classrooms	30	102.0	91.5	2	2	1	3 *	-
	50	82.0	97.0	1	2	2	-	-
	70	27.0	16.0	1	1	1	-	-
	100	22.0	27.0	1	-	-	1 **	-
	160	39.0	15.0	1	-	1	-	-
	190	9.0	6.0	-	1	-	-	SWNG ***
	250	14.5	11.0	1	-	1	-	-
	400	-	3.0	-	1	-	-	WOOD 2 or CIRS
Subtotal - Weekly Scheduled Hours		295.5	266.5					
Number of Rooms Required				7	7	6	4	
Break Rooms								
Total Booked Hours	10	21.0	171.0	11	11	11		
Concurrent Hours		3.0	18.0					
Total		316.5	437.5					

* FNH 30, FNH 40, FNH 50
** FNH 60
*** Possibly 121, 122, 221, or 222

Note: Facilities Planning Learning Space Team has been interested in changing the room capacities of the FNH classrooms to align with the new Learning Space Design Guidelines. The primary users, LFS, have been reluctant to agree to a reduction in seats in those rooms. If new General Teaching Space is built in the MacMillan renew project, FP will take that opportunity to adjust the capacities in FNH. Therefore, for future planning, this Program assumes FNH will have General Teaching Space capacities of 1@27, 3@30 and 1@99.

For reference, key general criteria for planning classrooms include:

- Learning space design will comply with the UBC Learning Space Design Guidelines, Technical Guidelines, Building Code and other UBC guidelines and specifications as required. Along with the requirements of these documents, key general considerations include:
  - moveable chairs and tables for flat floored classrooms and seminar rooms and movable chairs and fixed tables for tiered theatres,
  - multiple marker boards in all classrooms,

  - two to three large displays that do not cover marker boards,
  - lectern; and
- Additional tiered large group theatre criteria (160 and 250-seats):
  - enhanced instructor movement by providing additional and wider up and cross aisles,
  - capacity for lecture capture,
  - back of room shelf capacity for exam pickup and assignment drop-off,
  - adjacent projection room, entry vestibule and storage rooms as required.

Instructional Labs

The following table identifies the number of weekly section hours for each instructional lab type, along with section sizes and the number of rooms required. As for classrooms, a maximum teaching lab time utilization rate assumes a 45-hour week (up to 9 scheduled lab hours per day, Monday to Friday, and a 65% factor to allow for scheduling inefficiencies and lab set up times. These assumptions result in a maximum scheduled room utilization of approximately 30 hours per week.

Lab Type	No. Seats	Future (2023/24) Section Hrs per Wk.		No. Rms. Required (45 hrs x65%=30 hrs/wk.)	
		Fall	Winter	Fall	Winter
Type 1: Soils	32	18.0	30.0	1	1
Type 2: Wet Lab	32	23.0	14.0	1	1
Type 3: Dry Lab	32	10.0	4.0	1	1
Type 4: Computer Lab*	32	-	-	-	-
Total		51.0	48 .0	3	3

* Computer Lab workload is assumed to take place in classrooms with support provided by computer stations in the Learning Centre.

For reference, key general criteria for planning teaching labs include:

- Flexible and generic lab spaces as possible;
- Provision of teaching walls and projection screens or monitors; and
- Subject to further review, generally providing 32 stations per labs.

Lab requirements, particularly for Soils Labs and Wet Labs, should be reviewed in subsequent phases of project development.

Type 1 Soils Laboratory attributes include:

- Flexible benches that can be relocated with power from above;
- Water and utility sink access on perimeter benches, with sand traps;
- Fume hood with 120v and 120v/30 Amp power;
- Storage capacity within the lab for specialized equipment; and
- Teaching marker board and digital projection;

Some of the lab assignments accommodated in the Soils Lab require extensive set up and take down time, with up to five hours required for each. The Soils Lab is also used for tutorials for selected courses.

Type 2 Wet Laboratory attributes include:

- Benches with power, gas and water with cup sinks;
- Laminar flow hood (1);
- Fume hood (2)
- Perimeter storage for analytic equipment and microscopes; and
- Teaching marker board and digital projection.

Type 3 Dry Laboratory attributes include:

- Flexible benches, with power;
- Water on perimeter benches;
- Teaching marker board and digital projection.

Informal Learning Space

ILS is essential to accommodate necessary completion of assignments, as well as to support informal study and informal meetings. For reference, the following informal study spaces are currently provided:

- Agora (Room 60), with 90-seats;
- Undergraduate Society Lounge (Room 66) with 10-seats; and
- Land One Base (Room 318J) with 30-seats.

For reference, and as per the UBC Learning Space Design Guidelines, academic buildings should provide ILS seats equivalent to at least 12%

of the total number of other learning space seats in the building. These ILS seats should generally be organized as 65% to 70% centralized and 30% to 35% decentralized. For reference and as proposed in the Master Program, there are 128 required teaching lab seats and approximately 640 required classroom seats for a total of 768 required learning space seats. This results in a need for approximately 92 ILS seats. Currently, between the rooms noted above, there are 130 seats.

Events accommodated in the Agora include:

- Weekly Wednesday Night Dinners with up to 100 attendees;
- Annual ACE Team Opportunities and Involvement Fair with up to 50 attendees;
- LFS Tri-Mentoring Program Kick-off Dinner;
- Student and Staff Christmas Party; and
- Monthly ACE Team events –with up to 40 attendees.

Note that the Dietetics Community Dinner, at one time held in the Agora, is located elsewhere on campus due to high demand.

LFS Undergraduate Society (LFS|US)

LFS|US currently is accommodated in Room 64, which acts as the office space, Room 62, which provides storage for LFS|US events and for the student run Agora Café, and Room 66, which provides a lounge with pool table, foosball and soft seating. More proximate storage is required for the Agora Café.

Lockers

Lockers are available for rent through the LFS|US, currently located adjacent to the Agora. It is thought that the lockers are not particularly well used with consideration given to the number that should be provided.

LOCATIONAL CRITERIA

Key locational criteria include:

- Classrooms – should be clustered together with the main entry, ideally on the ground or lower floor level;
- Instructional Labs – should be clustered together to the extent that is practical with the Soils Lab located on a lower floor level with easy access to the exterior; and
- Informal Learning – the main informal learning area should be located central and on a lower level, in some proximity to the main classroom and teaching lab areas.

PRELIMINARY SPACE REQUIREMENTS

Space requirements in the following table are indicated in terms of net square metres (nsm) and component gross square meters (cgsm).

		Area Requirements			
Ref	Space	units	nsm/ unit	nsm	Remarks
	1.0 Classrooms				
01	Seminar Room, 30-Seat	1		75.0	Flat floor, movable tables (2.5 nsm per station); with use also made of FNH 30, 40 and 50
02	Classroom, 50-Seat	2	125.0	250.0	Flat floor, movable tables, power at each seat (2.5 nsm per station)
03	Classroom, 70-Seat	1		165.0	Flat floor, movable tables, power at each seat (2.35 nsm per station)
	Classroom, 100-Seat, Tiered			0	Assumed in FNH 60
	Classroom, 120-Seat, Tiered			0	Assumed in other precinct facility
04	Classroom, 160-Seat, Tiered	1		368.0	Consider 2 rows per tier, power at each seat; to be confirmed
05	Projection Booth	1		17.0	
06	Vestibule	2	7.4	14.8	
	Classroom, 190-Seat, Tiered	1		0	Assumed use of SWNG 121, 122, 221 or 222
07	Classroom, 250-Seat, Tiered	1		537.0	Consider 2 rows per tier, power at each seat; to be confirmed (2.15nsm per station)
08	Projection Booth	1		17.0	
09	Vestibule	2	7.4	14.8	
10	Storage	1		9.3	For UBC interim storage of broken furniture
	Classroom, 400-Seat, Tiered			0	Assumed in other precinct facility, e.g., Wood 2 or CIRS
	Subtotal, 1.0 Classrooms			1,467.9	Estimated Component Gross Area @ 1.05 Factor = 1,540 CGSM
	2.0 Instructional Laboratories				
11	Soils Laboratory – 32 Seats	1		128.0	Movable benching, floor drain or alternative, fume hood (1), 220v power at perimeter bench, projection capable, (Room 102A = 101.4nsm) Equipment includes: • Drying oven • Weigh scale • Hot plate • Muffle furnace • Shakers (2) • pH metres (2)

Ref	Space	Area Requirements: units	nsm/ unit	nsm	Remarks
12	Preparation Room	1		40.0	Incl. fume hood, exhaust vent, over muffle furnace, wash-up area, with dishwasher, water distribution unit, eyewash stations, deluge shower, floor drain
13	Chemical Storage	1		5.4	Provide threshold, vented cabinets
14	Storage	1		20.0	For tools and equipment, and samples
15	Monolith Storage and Display			15.0	Locate in cabinets in corridor
16	Wet Laboratory, 32-Seat	1		160.0	Flexible/movable benching, fume hood (4), laminar flow hood (2), gas at each bench, projection capable (Room 220 = 101.4nsm and Room 240 = 120.0nsm)
17	Preparation Room	1		60.0	Incl. fume hood, wash-up area, 220v power, autoclave, protein digester (2)
18	Chemical Storage	1		5.4	Provide threshold, vented cabinets, separation of flammables and acids
19	Storage	1		20.0	For equipment, including microscopes
20	Cloak/Ante Room	1		9.3	For storage of personal effects and changing into lab coats
21	Cold Room	1		11.0	Shared by all instructional labs
22	Dry Laboratory – 32 Seat	1		112.0	Flexible/movable benching, marker board, projection capable (Room 342 = 73.0nsm)
23	Prep Room	1		40.0	Incl. benches, sink, storage cabinets
	Food Processing Pilot Plant	1		0	See Component B. Research Labs, Research Lab Support and Professional Masters Programs
	Subtotal, 2.0 Instructional Labs			626.1	Estimated Component Gross Area @ 1.20 Factor = 750 CGSM Existing area : 771.7nsm
	4.0 Academic Office and Related Support				
24	Office, APBBI Teaching and Research Support Technician	1		11.0	Located adjacent to Soils Lab
25	Office, FNH Education/ Research Support Technician	1		11.0	Locate adjacent to Wet Labs
	Subtotal, 4.0 Academic Office and Related Support			22.0	Estimated Component Gross Area @ 1.35 Factor = 30 CGSM

Ref	Space	Area Requirements: units	nsm/ unit	nsm	Remarks
	14.0 Common Use and Student Activity				
	LFS Undergraduate Society				
26	Student Society Office	1		20.0	Equivalent to existing
27	Student Society Storage	1		14.0	Equivalent to existing; for clubs, events
	Informal Learning Space and Instructional Break-Out Space				
28	Student Lounge	1		40.0	Accommodates soft seating, pool table and foosball; locate adjacent to Agora/equivalent
29	Informal Study Space – Central	1		230.5	Equivalent to Agora; accommodates approx. 100 at tables and chairs and soft seating
30	Break-Out/Group Study Rooms	11	14.0	154.0	Accommodates up to 10 people each; for small seminars, projects, and breakout groups; should be located in proximity to large classrooms; include projection capable, whiteboards, acoustic separator
31	Agora Café Service Area	1		20.0	Equivalent to existing
32	Prep Area	1		16.0	Equivalent to existing
33	Storage	1		12.0	Secure Storage; located in proximity to Agora Café
34	Land One Base	1		75.0	Accommodates 30 at tables and soft seating, kitchenette area
	Master Program Cohort Base			0	See Component B. Research Labs, Research Lab Support and Professional Masters Programs
	Subtotal, 14.0 Common Use and Student Activity			581.5	Estimated Component Gross Area @ 1.20 Factor = 700 CGSM *Existing area: 686.5nsm*
	TOTAL			2,697.5	Estimated Component Gross Area @1.12 Factor (average) = 3,020

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B. RESEARCH LABS, RESEARCH LAB SUPPORT AND PROFESSIONAL MASTERS PROGRAMS

This component will accommodate the Research Lab, Research Lab Support spaces for LFS in the H.R. MacMillan building, as well as the cohort bases of the Professional Masters programs. Office and related office support and meeting room requirements are described in component C. Academic and Administrative Offices and Related Support.

Research Labs should be organized and based on the following principles:

- As much as possible, research lab space will be generic to support changing research foci;
- Centralized cores will be developed for specialized equipment and support spaces to better share resources;
- Space requirements will be driven by research team sizes;
- Research graduate students will be located close to PIs and research labs;
- Research graduate student workstations will be centralized as much as possible in interdisciplinary pods;
- Computational/desk-based research will include graduate student workstations; and
- Informal socializing areas will be shared to support interdisciplinary collaboration.

Research is currently conducted in the following areas:

- Biometeorology and Soil Physics;
- Soil, Water and Sustainability;
- Sustainable Agricultural Landscapes;
- Plant-Insect Ecology and Evolution;
- Entomology;
- Plant Breeding;
- Weed Science;
- Animal Welfare;
- Sustainable Food Systems;
- Nutrition; and
- Food Processing.

Research Lab Types

For the purposes of the Master Program and subject to review during more detailed planning, key principles and working assumptions for defining most research space requirements are as follows:

Research Lab Type 1: Computer/Computational Labs

Key Criteria include:

- Primarily comprised of open area desks for research teams (graduate students, post-doctoral fellows, research assistants, research associates, undergraduates, visiting scholars), plus support space for a small group informal meeting table, whiteboard stations, and a mid-sized couch;
- Sufficient research team desks to accommodate research team members from multiple research faculty, to support the ebb and flow of teams as well as interaction between teams;
- Research team member desk sizes of 5'x2' (1.524m x 0.61m);
- Access to nearby/same floor shared kitchen, lounge and securable printer alcoves. For the purpose of the Master Program, it is assumed that 1 kitchen, 1 small lounge and 1 securable printer alcove per research lab floor is required;
- Access to nearby/same floor shared phone/Skype/small meeting rooms and small group (2 to 4) research team meeting rooms. In addition, four to six person graduate student project rooms are also required;
- Design to consider some coat hooks, cubby and/or small locker space for undergraduate students who may not be assigned a dedicated desk;

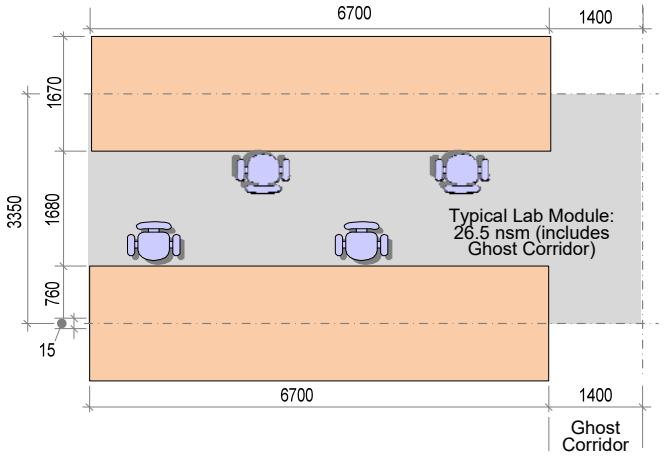
Research Lab Type 2: Bioengineering/ Dry Lab

Key Criteria include:

- Flexible tables used for the design and assembly of specialized and one-off electronic equipment as well as for propagation and rearing of insects;
- Service requirements for biometeorology include power at bench top, compressed air and portable tanks of gases; This lab should be vibration free;
- Graduate students and Research Associates will have stations in Graduate Student/Research Assistant Commons areas;
- Support areas required in close proximity to the Biometeorology Lab include a calibration room/chamber, a small instruments electronics workshop, a metal workshop

to fabricate equipment, as well as access to a wood workshop;

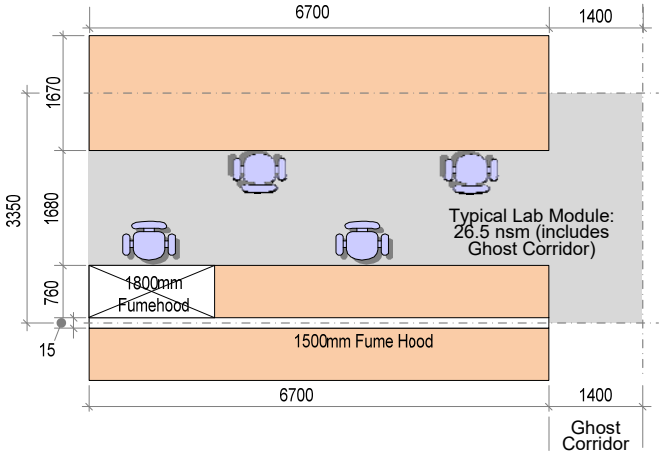
- Typical Lab module is shown below:



Research Lab Type 3: Soils Lab

Key Criteria include:

- Flexible wet lab supporting primary processing/analytic activities related to soils and plants;
- Includes flexible benches which may be equipped or outfitted in a variety of ways, including gas and water on benches;
- Selected lab modules may have a fume hood;
- Requires power for drying ovens and materials/plumbing that supports acid wash;
- Incl. space for portable tanks of gases.

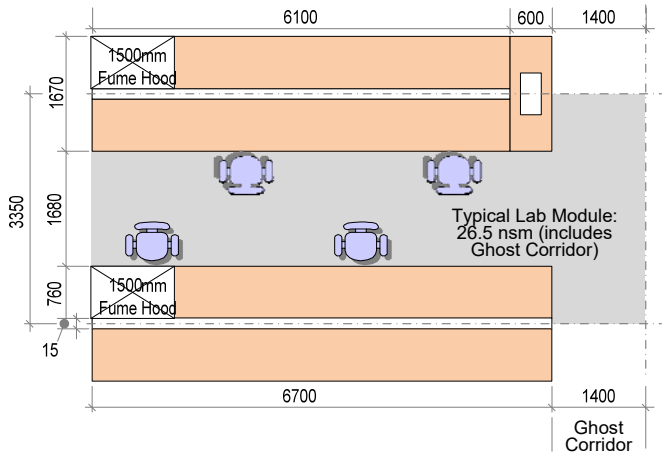


- Research cores located in proximity include drying and sieve rooms, chemical storage, cold room, freezer room, shared equipment room for chromatography;
- Graduate students and Research Associates will have stations in Graduate Student/Research Assistant Commons areas;

Research Lab Type 4: Wet Research Lab

Key Criteria include:

- Flexible highly serviced wet lab supporting refined processing/analytic activities related to plants, insects, tissue culture;
- Fume hoods may be provided at rate of 1 per 3 modules, although this may vary between research areas;
- Labs may need to accommodate, benchtop analytic equipment, muffle furnaces, centrifuges, shakers, etc.;
- Research cores located in proximity include chemical storage, cold room, food safe cold room, freezer room, shared equipment room for PCR and chromatography, growth chambers, and tissue culture;
- Graduate students and Research Associates will have stations in Graduate Student/Research Assistant Commons areas; and



Pilot Plant

Pilot Plant activities are related to the Food and Human Nutrition programs, currently accommodated in the Food Nutrition Health Building. The Pilot Plant serves both as a research and teaching support lab. Although it does not accommodate weekly labs, courses, including 325, 326 and 425 make use of the facility for a two-day lab. It is also

used as a demonstration space. Graduate students can also make use of the lab for research projects.

Research Lab Support

The following were identified as research lab cores that could be shared by various research labs/groups. They are organized by location and affinity to research areas:

Service Entrance/Service Elevator/Soils Lab

- Biosafety/Risk Management Room;
- Field wash-up area;
- Plant and soil drying space;
- Sieve room;
- Central chemical storage;
- Field equipment storage;
- Cold room – non-food safe;
- Cold room – food safe;
- Freezers;
- Analytic equipment;

Bioengineering/Dry Lab

- Workshop – Metal;
- Workshop – Wood;
- Workshop – Electronics;
- Calibration room – temperature and humidity controlled; and

Wet Lab

- Growth chambers and cooling towers;
- Analytic equipment – gas chromatography and Mass spectrometry;
- Tissue culture room;
- Cold room – non-food safe;
- Cold room – food safe;
- Freezers; and
- Wash-up/autoclave room.

Graduate Student/Research Assistant Commons and Professional Masters Cohort Rooms

Commons will be provided for research graduate students and research assistants on or associated with teams conducting research in specialized labs. Criteria will include:

- Research Graduate Students (Masters, PhD) Growth: research Masters and PhD student growth is based on achieving an average research team size five graduate students per research faculty;
- One lab-based workstation (5'x2' workstation) per FTE research graduate student (Masters, PhD) or post-doctoral fellow that is active in research (See component B Research Labs and Research Lab Support);
- Open area workstation or shared office (2 desks per office) for other research staff as appropriate;
- Shared Informal Lounge/Kitchenettes provided on two floors;
- Meeting/Phone/Skype booths provided on two floors;
- A Meeting/Phone/Skype Room, accommodating four people; and
- A central lounge for graduate students, faculty and staff.

Each of the Professional Masters Programs will have a student cohort room that includes study and informal learning space. They include:

- MFRE Cohort Room (currently Room 360P with 18-seats);
- MLWS Cohort Room (currently Room 156 with 10-seats); and
- In the future, a Cohort Room will be provided for new Professional Masters program that is anticipated to accommodate 15 students.

FACTORS DETERMINING SIZE

The following table identifies research labs by lab-type and Principal Investigator, including the number of graduate students, PDFs, Research Assistants, Visiting Scholars, etc.

Lab Type -Group (Principal Investigator)	Grad Students	PDF/RA, Visiting Scholar	Technician	Lab Manager	Other (Ugrad, Admin., etc.)	Total Team
Computer/ Computational						
-Animal Welfare (Weary, Fraser, von Keyserlingk)	23.0	1.0	0.5	1.0	-	25.5
-Centre for Sustainable Food Systems (Wittman)	5.0	4.0	2.0	-	5.0	15.0

Lab Type -Group (Principal Investigator)	Grad Students	PDF/RA, Visiting Scholar	Technician	Lab Manager	Other (Ugrad, Admin., etc.)	Total Team
-New NSERC-IRC	6.0	1.0	0.5	-	-	7.5
Bio-Engineering/Dry Lab						
-Biometeorology and Soil Physics (A. Black)	7.0	4.0	1.0	1.0	3.0	16.0
-Entomology (Carrillo)	3.0	2.0	-	-	4.0	9.0
Soils						
-Soil-Water Systems (Lavkulich)	3.0	1.0	-	1.0	2.0	7.0
-Soil/Sustainable Ag. Landscapes (Smukler, Krzic)	15.0	4.0	2.0	1.0	15.0	37.0
-New Soils	5.0	1.0	-	-	3.0	9.0
-New Soils	5.0	1.0	-	-	3.0	9.0
Wet Lab						
-Plant-Insect Ecology and Evolution (Carrillo)	4.0	1.0	1.0	-	4.0	10.0
-Indigenous Research Partnerships (Jovel)	7.0	-	1.0	-	-	8.0
-Plant Breeding (Riseman)	-	-	-	1.0	3.0	4.0
-Weed Science (Upadhyaya)	2.0	1.0	-	-	2.0	5.0
-Applied Animal Biology	3.0	1.0	-	-	-	4.0
-New Plant	5.0	1.0	-	-	3.0	9.0
-New Plant	5.0	1.0	-	-	3.0	9.0
Total	98.0	24.0	8.0	5.0	50.0	184.0

The following table identifies the numbers of students for each of the Professional Masters programs that will be accommodated within the MacMillan Building.

	Existing (2018/19)	Future (2023/24)			
Position	FTE	FTE	Head-count	Workspace Required	Remarks
Graduate Students					
Master of Food and Resource Economics	36.0	50.0	50.0	Cohort Room	
Master of Land and Water Systems	18.0	25.0	25	Cohort Room	
New Professional Graduate Program	-	15.0	15	Cohort Room	
Total	54.0	90.0	90		

Staffing Estimates

The following table summarizes current (year 2018/19) and estimated future projected (year 2023/24) staffing in terms of Headcount (HC) and Full-Time Equivalents (FTE). Only those faculty actively conducting research in the MacMillan Building are noted below.

	Existing (2018/19)	Future (2023/24)			
Position	FTE	FTE	Head-count	Workspace Required	Remarks/ Research Group
Research Staff					
Applied Biology Program and Animal Welfare Research Coordinator	1.0	1.0	1	1 Shared Office	Animal Welfare Group
Animal Welfare Research Assistant	2.0	2.0	2	2 Shared Office	Animal Welfare Group
Academic Director, CSFS	(1.0)	(1.0)	(1)		See Component C Academic and Administrative Offices and Related Support
CSFS Operations Manager	1.0	1.0	1	1 Office	
Marketing & Communications Coordinator	1.0	1.0	1	1 Semi-Private Office	CSFS
Communications Assistant	0	1.0	1	1 Semi-Private Office	CSFS
Research Manager	1.0	1.0	1	1 Semi-Private Office	CSFS
Community-Engagement Education Manager	1.0	1.0	1	1 Shared Office	CSFS
HR and Finance Coordinator	1.0	1.0	1	1 Shared Office	CSFS
Teaching and Learning Coordinator	0	1.0	1	1 Shared Office	CSFS
Educational Programming Coordinator	0	1.0	1	1 Shared Office	CSFS
Data Manager	1.0	1.0	1	1 Shared Office	CSFS
ACARN Coordinator	1.0	1.0	1	1 Shared Office	CSFS
ACARN Research Assistant	1.0	1.0	1	1 Shared Office	CSFS
Feeding Growth Assistant	0	1.0	1	1 Shared Office	CSFS
Research Assistant	1.0	1.0	1	1 Shared Office	
Research Engineer	1.0	1.0	1	1 Office	
Engineering Technician	1.0	1.0	1	1 Office	
Lab and Field Assistant	2.0	2.0	2	2 Shared Office	
Subtotal Research Staff	16.0	20.0	20	20	
Faculty					

Position	Existing (2018/19) FTE	Future (2023/24) FTE	Future (2023/24) Head-count	Future (2023/24) Workspace Required	Remarks/ Research Group
Full/Associate/Assistant Professor	13.0	18.0	18		See C. Academic and Administrative Offices and Related Support
Active Emeriti	5.0	6.0	6		See C. Academic and Administrative Offices and Related Support
Subtotal, Faculty	18.0	24.0	24	- -	
Graduate Students					
MSc – Applied Animal Biology	11.0	14.0	14	14 Shared Office	Also, Zoology and Aggasiz
MSc - Integrated Studies in LFS	8.0	10.0	10	10 Shared Office	
MSc - Plant Science	5.0	8.0	8	8 Shared Office	Also in Forestry
MSc - Soil Science	11.0	14.0	14	14 Shared Office	Also in Forestry
PhD - Applied Animal Biology	19.0	24.0	24	24 Shared Office	Also Zoology and Aggasiz
PhD - Integrated Studies in LFS	14.0	18.0	18	18 Shared Office	
PhD - Plant Science	1.0	3.0	3	3 Shared Office	
PhD - Soil Science	8.0	10.0	10	10 Shared Office	
Subtotal, Graduate Students	77.0	101.0	101	101	
Total	111.0	141.0	141	117	

LOCATIONAL CRITERIA

Key locational criteria include:

- Soils Labs and research cores that are related to incoming soils and plants should be located on the lower level of the facility, where they are close to a service entrance and the service elevator;
- The Bio-Engineering/Dry Labs may be located lower in the building as well, to support movement of equipment to the field and to be close to workshops;
- Wet Labs, which fall into two broad categories – general wet labs for soils and plants, and biochemistry/molecular biology labs – should be zoned separately;

- Graduate student commons should be developed for students conducting research in the Soils, Bio-Engineering and Wet Lab areas. Consideration should be given to integrating students from different research groups and locating them in close proximity to their research lab; and
- Students in the computational research areas will be provided with desks within the labs. Consideration should be given to creating student research areas that integrate students from different research focus areas or groups.

PRELIMINARY SPACE REQUIREMENTS

Space requirements in the follow18ing table are indicated in terms of net square metres (nsm) and component gross square meters (cgsm).

		Area Requirements			
Ref	Space	units	nsm/ unit	nsm	Remarks
	3.0 RESEARCH LABS				
	Research Lab Modules				
01	Research Lab Type 2: Bio-Engineering Research Lab	4	26.5	106.0	Flat floor, movable tables, vibration free, heavy electrical requirements
02	Research Lab Type 2: Dry Lab	3	26.5	79.5	Wide flexible benches
03	Research Lab Type 3: Soils Lab, Research Lab	5	26.5	132.5	Wet Lab, acid wash; 2 fume hoods
04	Lab Type 3: Wet Lab	30	26.5	795.0	Up to 10 fume hoods
05	Lab Type 3: Wet Lab – New	8	26.5	212.0	Up to 3 fume hoods
	Subtotal, 3.0 Research Lab Modules			1,325.0	Estimated Component Gross Area @ 1.10 Factor = 1,460 CGSM
	Research Cores				
06	Field Wash-Up Area	1		10.0	Locate near service entrance
07	Field Equipment Storage	1		30.0	Locate near service entrance
08	Drying Room	2	20.0	40.0	Locate near service entrance
09	Sieve Room	1		16.0	Locate near service entrance and soils labs; requires venting, negative pressure
10	Central Chemical Storage	1		24.0	Separate areas for liquids and solids
11	Chemical Storage, Flammable	1		7.4	
12	Workshop, Woodworking	1		24.0	As per existing; for woodworking tools and processes; includes dust extraction equipment
13	Workshop, Metalworking	1		24.0	As per existing; for metalworking tools and processes; includes large milling machine, lathe, air extraction
14	Cold Room – Non-Food Safe	4	9.3	37.2	
15	Cold Room –Food Safe	2	9.3	18.6	
16	Freezer Room	1		18.6	Accommodates upright freezers
17	Soils Archives	1		10.0	Accommodates 80 banker box equivalents on 4-shelf storage units
18	Calibration Room/Chamber	1		9.3	Temperature and humidity controls
19	Tissue Culture Room	2	13.9	27.8	Distributed
20	Biosafety Room	1		16.0	Negative air pressure, incubator, gas, fume hood, accommodates up to 3, vestibule

Ref	Space	Area Requirements: units	nsm/ unit	nsm	Remarks
21	Small Instruments Electronics Workshop	1		23.2	For working on integrated circuits, soldering
22	Shared Equipment/ Instrument Room	6	13.9	83.4	Distributed on each wet and soils lab level
23	Growth Chambers	1		24.0	Accommodates 6 growth chamber cabinets; requires cooling tower
24	Food Processing Pilot Plant	1		85.3	Accommodates classes of 25 for demonstrations, separate bench module (20.4nsm), pasteurizer, oven, steam canner; requires source of steam, ventilation hood, compressed air, gas, and 3-phase power; should conform to Good Manufacturing Process requirements
25	Solder/Paint Workshop	1		16.0	Accommodates 6 stations with ventilation
	Subtotal, Research Lab Cores			544.8	Estimated Component Gross Area @ 1.25 Factor = 680 CGSM
	<u>Research Computational Labs/Research Staff and Graduate Student Offices</u>				
26	Research Lab, Animal Welfare	1		159.0	Accommodates 30 research team member desks, (1.5m X .6m), 2 small meeting tables with 6-8 chairs, 3 white board stations; For: • Applied Biology Program and Animal Welfare Research Coordinator • Animal Welfare Research Assistant
27	Research Lab, Centre for Sustainable Food Systems	1		159.0	Accommodates 28 to 30 research team member desks, (1.5m X .6m), 2 small meeting tables with 6-8 chairs, 3 white board stations; For: • Marketing and Communications Coordinator • Communications Assistant (new) • Research Manager • Community Engagement Education Manager • HR and Finance Coordinator • Teaching and Learning Coordinator (new) • Educational Programming Coordinator (new) • Project Coordinator • Data Manager • ACARN Coordinator • ACARN Research Assistant • Feeding Growth Assistant (new)

		Area Requirements			
Ref	Space	units	nsm/ unit	nsm	Remarks
28	Office, CSFS Academic Director	1		11.0	
29	Office, CSFS Operations Director	1		11.0	
30	Graduate/Research Commons, 20 Desks	4	90.0	360.0	Accommodates 20 research team desks, (1.5m X .6m), small meeting tables with 6 chairs, 2 white board stations; accommodates Research Assistants
	Project Room, Graduate Students			0	See Breakout/Informal Study
31	Shared Office, Research Staff	1		16.0	For: • Research Engineer • Engineering Technician
32	Meeting/Phone/Skype Booths, 1-Seat	2	2.8	5.6	Bookable
33	Meeting/Phone/Skype Room, 4-Seat	1		11.0	Bookable
34	Informal Lounge/Kitchenette	3	20.0	60.0	10 seats each
	Subtotal, Research Computational Labs, Research Staff and Graduate Student Offices			792.6	Estimated Component Gross Area @ 1.15 Factor = 910 CGSM
	14.0 Common Use and Student Activity				
35	MFRE Cohort Room	1		125.0	Accommodates 40 at tables and soft seating, kitchenette area
	MFRE Support Staff			0	See component C. Academic and Administrative Offices and Related Support
36	MLWS Cohort Room	1		75.0	Accommodates 30 at tables and soft seating, kitchenette area
	MLWS Program Advisor			0	See component C. Academic and Administrative Offices and Related Support
37	New Professional Masters Cohort Room	1		37.5	Accommodates 15 at tables and soft seating, kitchenette area
	Subtotal, 14.0 Common Use and Student Activity			237.5	Estimated Component Gross Area @ 1.15 Factor = 275 CGSM
	TOTAL			**2,899.9**	**Estimated Component Gross Area @1.15 Factor (average) = 3,325**

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C. ACADEMIC AND ADMININSTRATIVE OFFICES AND RELATED SUPPORT

This component accommodates the main Faculty of LFS administrative areas, faculty offices, and research graduate workstations for activities in the H.R. MacMillan Building. It also includes office support activities, such as meetings, mail, photocopying and printing, office supplies and informal social interaction.

This component includes:

- LFS Dean's Office;
- LFS Marketing & Communications;
- LFS Development & Alumni Engagement (DAE);
- Student Services;
- Learning Centre; and
- Faculty offices.

Student Services provides academic advising and support to undergraduate students of the Faculty of LFS with specialty advising and support of Indigenous and international students as well as students who would like to participate in an exchange program. It also includes information and support for career pathways, and for student engagement. Due to similarities in services, Graduate Programs Student Services have also been included in this area.

The Learning Centre provides support to faculty, instructors and students, including the creation of videos, training of students through workshops on various topics, assisting with videoconferencing, and providing a library of equipment. The Learning Centre is closely aligned with the Faculty's Computer Services and, as such, staff numbers are provided below for both.

FACTORS DETERMINING SIZE

Key factors determining size include:

Administration offices and support facilities including:

- Office for Dean;
- Private, shared or open area workstations for administration staff as appropriate;
- General office support (photocopiers, office supplies, mail, lounge, minimal in-building archival records/equipment storage);
- Meetings and seminars related to administration, research and teaching;

Academic Offices:

- A standard office per FTE faculty including faculty, instructors, and academic directors; and
- Shared office space for other faculty including adjunct professors, affiliate professors, sessionals, lecturers, active emeriti, research associates.

Staffing Estimates

The following table summarizes current (year 2018/19) and estimated future projected (year 2023/24) staffing in terms of Headcount (HC) and Full-Time Equivalents (FTE) that will be accommodated within the MacMillan Building. Projected FTEs and HC will support expected growth in undergraduate and graduate student enrollments and new program offerings within the planning horizon of the Master Program. All information was provided by LFS.

When reviewing this table, key qualifiers include:

- Research Faculty: assumed to be net average growth of one over the next five years; and
- Instructional Faculty: no growth assumed over the next five years.

	Existing (2018/19)	Future (2023/24)			
Position	FTE	FTE	Head-count	Workspace Required	Remarks
Administration					
Dean's Office Coordinator	1.0	1.0	1	1 Shared Office	
Administrative Clerk, HR	1.0	1.0	1	1 Shared Office	
Director, HR and Administration	1.0	1.0	1	1 Office	
Faculty Liaison	1.0	1.0	1	1 Office	
Coordinator, Finance	1.0	1.0	1	1 Shared Office	
Clerk, Finance	1.0	1.0	1	1 Shared Office	
Senior Finance Manager	1.0	1.0	1	1 Office	
Manager, Faculty Operations	1.0	1.0	1	1 Office	
Community Outreach	-	1.0	1	1 Office	
Research Facilitator	1.0	1.0	1	1 Office	
Masters of Food Resource Economics (MFRE) Academic Coordinator	1.2	1.2	3	3 Shared Office	Locate with program area
MFRE Educational Researcher	2.0	2.0	2	2 Shared Office	Locate with program area
MFRE Graduating Projects Coordinator	0.4	0.4	1	1 Shared Office	Locate with program area

Position	Existing (2018/19) FTE	Future (2023/24) FTE	Head-count	Workspace Required		Remarks
MLWS Program Advisor	1.0	1.0	1	1	Office	Locate with program area
New Professional Program Advisor/Director	-	1.0	1	1	Office	Locate with program area
Subtotal, LFS Administration	13.6	15.6	18	18		
Marketing & Communications						
Director, Marketing & Communications	1.0	1.0	1	1	Office	
Marketing & Communications Specialist	1.0	1.0	1	1	Shared Office	
Coordinator, CSFS Marketing & Communications	1.0	1.0	1	1	Shared Office	
Subtotal, Marketing & Communications	3.0	3.0	3	3		
Development & Alumni Engagement (DAE)						
Assistant Dean, Development & Alumni	1.0	1.0	1	1	Office	
Associate Director, DAE	1.0	1.0	1	1	Office	
Development Coordinator	1.0	1.0	1	1	Shared Office	
Development Officer	2.0	2.0	2	1	Shared Office	
Manager, Alumni Relations	1.0	1.0	1	1	Shared Office	
Subtotal, DAE	6.0	6.0	6	5		
Student Services						
Director, Student Academic Services	1.0	1.0	1	1	Office	
Student Engagement Officer	1.0	1.0	1	1	Office	
Coordinator, Global Partnerships	1.0	1.0	1	1	Office	
Academic Advisor	1.0	1.0	1	1	Office	
Academic Advisor, International	1.0	1.0	1	1	Office	
Academic Advisor	2.0	2.0	2	2	Office	
Career Strategist	1.0	1.0	1	1	Office	
Subtotal, Student Services	8.0	8.0	8	8		
Graduate Programs						
Graduate Program Assistant	1.0	1.0	1	1	Office	
Manager, Graduate Programs	1.0	1.0	1	1	Office	
Subtotal, Graduate Programs	2.0	2.0	2	2		
Learning Centre						
Assistant Dean, Learning Technologies	1.0	1.0	1	1	Office	
Manager, Computer Systems	1.0	1.0	1	1	Shared Office	

Position	Existing (2018/19) FTE	Future (2023/24) FTE	Future (2023/24) Head-count	Future (2023/24) Workspace Required	Remarks
Systems Analyst, Learning Centre	1.0	1.0	1	1 Shared Office	
Programmer Analyst, Learning Centre	-	1.0	1	1 Shared Office	
Multimedia Developer	1.0	1.0	1	1 Shared Office	
Support Analyst	1.0	1.0	1	1 Shared Office	
P/T CTLT Faculty Liaison	0.5	0.5	1	1 Workstation	
Coop Student/Student	-	-	2	2	
Subtotal, Learning Centre	5.5	6.5	9	9	
Faculty					
Dean	1.0	1.0	1	1 Office	
Full/Associate/Assistant Professor	16.0	17.0	17	17 Office	
Instructor 1	4.0	4.0	4	4 Office	
Academic Director, Master of Land and Water Systems (MLWS)	1.0	1.0	1	1 Office	Locate with program area
Adjunct Professor	1.0	1.0	1		
Affiliate Professor	1.0	1.0	1		Includes 17 Headcount in 8 shared offices
Sessional	6.0	6.0	6	8 Shared Office	
Lecturer	3.0	3.0	3		
Active Emeriti	5.0	6.0	6		
Subtotal, Faculty	38.0	40.0	40	31	
Total	76.1	81.1	86	76	

LOCATIONAL CRITERIA

Key planning criteria will include:

General Criteria

- All office/administrative type areas shall be designed to be very flexible to allow for changing group sizes, interaction between groups and changes in mandate;
- The faculty offices and program offices shall be easily accessible from a major circulation corridor for students, staff and visitors;

Administration Area

- The Dean's Office, Marketing and Communications, and Development and Alumni Engagement should be located together as three office suites. The Dean's Office and Development and Alumni Engagement should each have a separate entrance. Access to Marketing and Communications may be through the Dean's Office. These may be located central to the Faculty spaces within the MacMillan Building;

- Student Services will be a separate suite of rooms that may be located close to the building entrance. (See component A. Classrooms, Teaching Labs, Student Support, and Informal Learning Space);
- Workstations are to be clustered in their respective groupings although the spaces will be accessible to one another and meeting and office support spaces will be shared;
- Private Offices: located proximate to Open Area Workstations for each area, but somewhat more removed from the Reception/Waiting Area;
- Learning Centre – should be located central to the Faculty space; and
- Student Services – should be located near the main public entrance in a suite of rooms.

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PRELIMINARY SPACE REQUIREMENTS

Space requirements in the following table are indicated in terms of net square metres (nsm) and component gross square metres (cgsm).

Ref	Space	Area Requirements: units	nsm/ unit	nsm	Remarks
	4.0 ACADEMIC OFFICE AND RELATED SUPPORT				
	LFS Dean's Office				
01	Reception/Waiting Area	1		10.0	Provides monitored access to this component
02	Open Office	1		30.6	For: • Coordinator, Dean's Office • HR Administrative Clerk • Finance Coordinator • Finance Clerk • Coop Student/Student (2)
03	Private Office	6	11.0	66.0	For: • Director, HR & Administration • Faculty Liaison • Senior Finance Manager • Faculty Operations • Research Facilitator • Community Outreach
04	Office, Dean	1		30.0	Workstation, meeting table (4 – 5 seats)
	Subtotal, Dean's Office			136.6	
	Marketing & Communications				
05	Office, Director, Marketing & Communications	1		11.0	Workstation, meeting table (2-3 seats)
06	Office, Marketing & Communications Specialist	1		11.0	Provides access to Director's Office
07	Storage, Marketing & Communications	1		8.0	Secure storage with open, adjustable shelving
	Meeting Room, Shared			0	See Ref. 29/32
	Subtotal, Marketing & Communications			30.0	
	Development & Alumni Engagement (DAE)				
08	Private Office	2	11.0	22.0	For: • Coordinator, Assistant Dean, DAE • Associate Director

Ref	Space	Area Requirements units	nsm/ unit	nsm	Remarks
09	Open Office	1		21.6	For: • Development Coordinator • Development Officer (2) • Manager, Alumni Relations
	Meeting Room, Shared			0	See Ref. 29/32
	Subtotal, DAE			43.6	
	Learning Centre/Computer Services				
10	Learning Centre	1		55.0	Accommodates 15 workstations (Room 266 = 30.0nsm)
11	Meeting Room	1		12.0	Accommodates up to 4 people
12	Office, Director, Learning Centre/Assistant Dean, Learning Technologies	1		11.0	
13	Shared Office, Computer Services/Learning Support	1		62.0	For: • Manager, Computer Systems • Systems Analyst • Programmer Analyst • Multimedia Developer • Support Analyst • P/T CTLT Faculty Liaison • Work-Learn station • Co-op student station and swing station • Central meeting space
14	Equipment Storage	1		16.0	Incl. workbench
	Subtotal, Learning Centre/ Computer Services			156.0	
	Student Services				
15	Waiting/Check-In Area	1		18.0	Close to Building entry; 6 soft seats; space for informational brochures on wall mounted racks, small table
16	Workstation, Program Assistant	1		4.0	Locate adjacent to Waiting/Check-In Area

Ref	Space	Area Requirements: units	nsm/ unit	nsm	Remarks
17	Office, Assigned	10	11.0	110.0	For: • Director • Manager Graduate Programs • Graduate Programs Assistant • Student Engagement Officer • Coordinator Global Partnerships • Academic Advisor (2) • Career Strategist • Indigenous Academic Advisor
18	Workstation, Learning Coordinator (Work-Learn Student)	1		4.0	Can be located away from Entrance to Suite
19	Printer/Supplies	1		7.4	
20	Storage	1		11.0	May be located close to service entrance
	Subtotal, Student Services			154.4	
	<u>Faculty Offices</u>				
21	Office, Professor/Assoc. Prof./Assistant Prof.	17	11.0	187.0	Workstation, meeting table (2-3 seats)
22	Office, Instructor	4	11.0	44.0	Workstation, meeting table (2-3 seats)
23	Office, Adjunct, Affiliate Professors, Sessionals, Lecturers, Active Emeriti	8	11.0	88.0	2 Workstations in each office, meeting table, 3 seats, shared storage
	Subtotal, Faculty Offices			319.0	
	<u>Program Offices</u>				
24	Shared Office, MFRE	1		32.4	For: • Academic Coordinator (3) • Educational Researcher (2) • Graduating Projects Coordinator • Locate with program base
25	Office, Academic Director, MLWS	1		11.0	Workstation, meeting table (2-3 seats); locate with Program Base
26	Office, MLWS Program Advisor	1		11.0	Workstation, meeting surface (2-3 seats); locate with MLWS program base and research lab
27	Office, New Professional Program Advisor/Director	1		11.0	Workstation, meeting surface (2-3 seats); locate with new program base Lab and project space
	Subtotal, Program Offices			65.4	

Ref	Space	Area Requirements units	nsm/ unit	nsm	Remarks
	Shared Staff Support				
28	Meeting Room, 15-Seat, Shared	2	37.5	75.0	Accessible from general circulation, 15 seats, three tables for configuration flexibility; two writing/presentation walls, AV/multimedia, teleconference and videoconference capable
29	Seminar/Multipurpose Room	1		50.0	Combine with Faculty/Graduate Student Lounge
30	Faculty/Graduate Student Lounge	1		74.2	Incl. 25 seats in a combination of soft seating and seating at tables, sink and counter, refrigerator, microwave; adjoins and can be combined with Seminar Room
31	Meeting Room, 6-Seat, Shared	2	12.0	24.0	Accessible from general circulation, 6 seats, two writing/presentation walls, AV/ multimedia, teleconference and videoconference capable
32	Business Workroom	1		9.3	Locate one with Administrative office zone and one central to faculty offices
33	Mail/Workroom			11.0	
34	Storage Room, Supplies, Equipment	1		8.0	Locate with Administrative office zone
35	Faculty Archives Storage	1		11.0	
	Subtotal, Shared Staff Support			262.5	
	Graduate Program Administrative Space				
	Workstations, MSc LFS Integrated Studies, Plant Science, Soil Science Pod			0	See component C. Research Labs and Research Lab Support
	Workstation, Animal Welfare			0	See component C. Research Labs and Research Lab Support
	Workstation, PhD Integrated Studies in LFS Pod			0	See component C. Research Labs and Research Lab Support
	Workstation, PhD Plant Science, Soil Science Pod			0	See component C. Research Labs and Research Lab Support
	Subtotal, Graduate Program Administrative Space			0	
	TOTAL			**1,167.5**	**Estimated Component Gross Area @ 1.35 Factor = 1,575 CGSM**

D. BUILDING SERVICES AND END-OF-TRIP FACILITIES

This component accommodates support functions for the Faculty of LFS in the H.R. MacMillan building. Support functions include:

- Main entry foyer;
- A service entrance with easy access to associated Faculty general support spaces, including chemical storage, field equipment storage, and workshops;
- Housekeeping and building maintenance;
- Building communications rooms and closets;
- End-of-Trip facilities; and
- Storage activities – Building, Janitorial, Equipment, Maintenance.

FACTORS DETERMINING SIZE

Key factors within the Back of House component include:

- Main entry foyer: a minimal placeholder area is required to support design of the main entry to the facility. This area is subject to design; however, considerations include circulation, wayfinding, crush space adjacent to large classrooms and theatres, display stations, fixed display cases, and a welcoming bright atmosphere;
- Service Entrance: this serves the significant and often messy materials that will be moved into the facility and includes receiving, shipping, staging of materials and equipment. All deliveries will be scheduled;
- Staffing: A Purchasing Agent will be located in this component as identified below:

	Existing (2018/19)	Future (2023/24)			
Position	FTE	FTE	Head-count	Workspace Required	Remarks
Administration					
Technician – Purchasing Agent	1.0	1.0	1	1 Office	
Total	1.0	1.0	1	1	

- Housekeeping and building maintenance: placeholder areas included are subject to review by UBC Building Operations (Custodial Services);
- Communications rooms: Provided as per current UBC standards and subject to review by UBC AV/IT. Example functions in these rooms include:

  - one to two full sized data racks and with all building network equipment,
  - wall terminations for the voice cabling terminations,
  - UPS,
  - wall terminations for coax cable,
  - secure access panels,
  - cable tray for cables terminating in the rooms,
  - any vertical riser conduits.
- Long term bicycle parking and end-of-trip shower and washroom facilities: will be determined as per the *UBC Campus Plan to 2030: Campus Wide Design Guidelines* (p.41, 43). The number of short-term outdoor bicycle parking spaces will be worked out using the *Guidelines* and with Facilities Planning at the time of project initiation; and
- Food services: as a placeholder and for reference only, the existing 'Agora' Café (Rooms 59 and 59A) and described under component A. Classrooms, Teaching Labs, Student Support, Informal Learning Space. No other food services requirements planning has been undertaken. However, once further approvals have been concluded, food services could be considered with review by UBC Food Services.

LOCATIONAL CRITERIA

Subject to design and review by UBC, key locational criteria include:

- Ideally, outside bicycle parking should be covered and located in a highly visible area;
- LFS Faculty Operations and Purchasing staff should be located adjacent to the service entry and service elevator;
- Central supplies and equipment rooms should be located adjacent to the service entry; and
- Housekeeping rooms should be minimally provided at one to two per floor.

PRELIMINARY SPACE REQUIREMENTS

Space requirements in the following table are indicated in terms of net square metres (nsm) and component gross square meters (cgsm).

		Area Requirements			
Ref	Space	units	nsm/ unit	nsm	Remarks
	Administration				
01	Shared Office	1		7.4	For Technician/Purchasing Agent
02	Stores/Staging	1		8.0	
	Subtotal, Administration			15.4	
	Faculty Support				
	Gas Storage	1		0	May be external and covered; if internal, provide a blast panel and area of approximately 7.4nsm
	Subtotal, Faculty Support			0	
	General Building Support				
03	Main Entry Foyer, Placeholder	1		37.2	Subject to design, placeholder area is minimum and a significantly larger area with a range of attributes should be considered
04	Central Supply Room	1		30.0	Subject to review by UBC and design
05	Housekeeping Room	2	13.9	27.8	Subject to review by UBC and design; assumes 1 room for every two floors
06	End-of-Trip Facilities	2	18.6	37.2	Placeholder, subject to review
	Communications Rooms, Placeholder			0	Assumed to reflect UBC standards and to be part of the building gross-up areas
	Subtotal, General Building Support			132.2	
	TOTAL			**147.6**	**Estimated Component Gross Area @ 1.10 Factor = 160 CGSM**

APPENDICES

APPENDIX A: DEFINITIONS OF TERMS

APBI – Applied Biology

AV (AUDIO-VISUAL SYSTEMS) - Systems which communicate information to audiences by means of audio-supported image displays.

BIOLOGICAL SAFETY CABINET (BSC) - BSCs are safety devices that are used for primary containment of biohazardous materials. These units are uniquely different from other types of laboratory hoods, and installation involves specific design considerations. BSCs are available in several classifications.

BGSM – Building Gross Square Metres.

BUILDING GROSS SQUARE METRES - The sum of all building floor areas measured to the outside face of exterior walls for all stories or areas having floor surfaces. Gross area includes component gross areas, washrooms, telephones, general display, general circulation, mechanical and electrical space and exterior walls.

BUILDING SYSTEMS - All of the utilities and physical support systems and controls for the environmental support of all the elements of the facility, and the operational support of the delivery system, including: mechanical, electrical, structural, plumbing, circulation, cladding and interior finishing systems.

CSFS – Centre for Sustainable Food Systems.

CGSM – Component Gross Square Metres

CLADDING, EXTERIOR - Those components of a building which are exposed to the outdoor environment and are intended to provide protection against wind, water or vapour.

COMPONENT - A cohesive grouping of activities or spaces related by service or physical arrangement. A planning component may or may not be a department, since the term "department" refers to an administrative rather than a functional organization.

COMPONENT GROSS SQUARE METRES - That portion of a building assigned to a specific component/department, including net areas, internal circulation, partitions, building structure and small plumbing shafts. Component gross area is measured to the inside face of exterior walls and to the centre line of partitions adjoining other components/departments or general circulation space.

COMPONENT NET SQUARE METRES - That portion of a building assigned to a specific component/department but including only the net

assignable areas. The internal circulation, partitions, building structure and small plumbing shafts are not included in this measurement.

EXIT - That part of a means of egress that leads from the floor area it services, including any doorway leading directly from a floor area, to a public thoroughfare or to an approved open space.

EXTERNAL RELATIONSHIPS - The functional relationships and key adjacencies or proximities of one component to another.

FTE - FULL TIME EQUIVALENT - For staff, a term used to express the conversion of a number of annual paid hours into the number of individuals who, if they were working a complete shift on a regular schedule basis, would be required to accommodate that number of hours.

FUME HOODS - Fume hoods are utilized for the isolation and extraction of volatile and/or toxic fumes. They are typically 4 ft, 5 ft, 6 ft or 8 ft in length. Fume hoods may be constant-volume or variable-volume exhaust hoods depending on user and facility management considerations of function, first cost, and lifecycle cost issues. Fume hoods exhaust completely to the outside.

FUNCTIONAL COMPONENT - See "COMPONENT"

GENERAL CIRCULATION - The total system of connecting links that enable movement of people and materials throughout the facility, between rather than through departments; i.e., main corridors, elevators, stairs, etc.

GROSSING FACTORS - Multiplication factors applied (1) to net areas for each room or element within a component, and (2) to gross component areas. These factors allow for space requirements not included in net element or room measurements; see "Component Gross Square Metres" and "Building Gross Square Metres".

HEADCOUNT - The number of people actually working in an area at peak utilization. This includes part-time and full-time employees.

HORIZONTAL SERVICE SPACE - A space such as an attic, duct, ceiling, roof, crawl space or basement oriented essentially in a horizontal plane through which building services such as pipes, ducts and wiring may pass.

MAXIMUM OCCUPANCY - The maximum number of people expected to be within an area at peak utilization. This figure includes visitors, employees and students.

MCML – H.R. MacMillan Building.

MFRE – Master of Food and Resource Economics

MLWS – Master of Land and Water Systems

NET SQUARE METRES (NSM) - The horizontal area of space assignable to a specific function. The net areas of rooms are measured to the inside face of wall surfaces.

PBL - Problem based learning.

PDF – Post-Doctorate Fellow

PI – Principal Investigator.

PLUMBING SYSTEM - A drainage system with a venting and a water system or parts, thereof. It includes: drinking water, waste and vent, fluid fuels, medical gases, housekeeping vacuum, compressed air.

RA – Research Assistant.

RESTRICTED CIRCULATION - Internal circulation which can be entered only by a passing a control point.

SCALE-UP - Student-Centered Active Learning Environment with Upside-down Pedagogies. A learning environment specifically created to facilitate active, collaborative learning in a studio-like setting, with spaces designed to facilitate interactions between teams of students.

SECTION HOUR - Section Hours are the number of scheduled hours of instruction (e.g. if there are 3.0 hours per week for Crse100, with a course enrolment of 40 and a section size of 20 and therefore 2 sections, then there are 3.0 x 2 sections = 6.0 section hrs per week.

SERVICE SPACE - A space provided in a building to facilitate or conceal the installation of building services such as chute, ducts, pipes, shafts or wires.

UBC - The University of British Columbia.

UPS – Uninterrupted Power Supply.

WEEKLY STUDENT CONTACT HOUR - Weekly Student Contact Hours (WSCH) are the product of course enrolment times the hours of scheduled instruction for that course per week.

WSCH - Weekly student contact hour.

Appendix B - Course Workload Details

APPENDIX B- COURSE WORKLOAD DETAILS

The following tables summarize detailed current (year 2018/19) and future (year 2023/24) LFS section hour workload information utilized to estimate teaching space requirements. Reflecting the format that information was provided by LFS, tables include:

1. Classroom Section Hours Workload; and
2. Teaching Labs Section Hours Workload.

The information in these tables is summarized in component 1. Classrooms, Teaching Labs, Graduate Student Support, and Informal Learning Space.

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1. Classroom Section Hours Workload

The following table includes detailed existing and future (2023/24) course and section hour information for graduate Masters and PhD courses.

					CURRENT				FUTURE (2023/24)								
Course	Crse #	Sect,	Room Type	Current Building	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse (2017 W2)	# Students Enrolled in Crse (2017)	# Students Enrolled in Crse (W1)	# Students Enrolled in Crse (W2)	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk W1+W2	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per Wk W1	# Total Sched Hrs per Sect per Wk W2	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Breakout/Small Seminar Rooms																	
APBI	260	001	discussion	MCML	7			8			7		7	3.0	21.0	-	All concurrent; small group ideally with screens and white boards.
LFS	450	001	breakout	MCML		3			5			10	10	3.0	-	30.0	All concurrent
FNH	303	001	breakout	MCML					7			9	9	3.0	-	27.0	All concurrent
FNH	477	001	breakout	MCML					7			12	12	3.0	-	36.0	All concurrent
FNH	473	001	breakout	MCML					9			9	9	3.0	-	27.0	All concurrent
FNH	313	001	breakout	MCML					10			11	11	3.0	-	33.0	small group ideally with screens and white boards. Rooms used concurrently
FNH	451	001	breakout	MCML					10			6	6	3.0	-	18.0	All concurrent
Total - Breakout/Small Seminar Rooms															3.0	18.0	
Standard Classroom - 30 Seats																	
APBI	499		seminar	MCML	4	7		10	10		1	1	2	1.5	1.5	1.5	
SOIL	500	001	seminar	MCML	3			5			1		1	1.5	1.5	-	
SOIL	500	003	seminar	MCML		2		5			1	1	2	1.5	1.5	1.5	
FOOD	510	001	lecture	FNH	11			11			1		1	3.0	3.0	-	
HUNU	505	001	lecture	FNH		0			10			1	1	3.0	-	3.0	
APBI	417	001	lecture	MCML	9			9		20	1		1	3.0	3.0	-	
FNH	330	L1A	lab	MCML	20				13		1		1	2.0	2.0	-	Tuesday wine tasting - needs a food grade spce - cannot be in a 'wet/chemical' lab classroom with table - Total of 200 students
FNH	330	L1B	lab	MCML	23				13		1		1	2.0	2.0	-	Tuesday
FNH	330	L1C	lab	MCML	25				13		1		1	2.0	2.0	-	Tuesday
FNH	330	L1D	lab	MCML	22				13		1		1	2.0	2.0	-	Tuesday
FNH	330	L1E	lab	MCML	25				13		1		1	2.0	2.0	-	Thursday
FNH	330	L1F	lab	MCML	25				13		1		1	2.0	2.0	-	Thursday
FNH	330	L1G	lab	MCML	25				13		1		1	2.0	2.0	-	Thursday
FNH	330	L1H	lab	MCML	21				13		1		1	2.0	2.0	-	Thursday
FNH	330	L2A	lab	MCML		23			13			1	1	2.0	-	2.0	Tuesday
FNH	330	L2B	lab	MCML		25			13			1	1	2.0	-	2.0	Tuesday
FNH	330	L2C	lab	MCML		23			13			1	1	2.0	-	2.0	Tuesday
FNH	330	L2D	lab	MCML		24			13			1	1	2.0	-	2.0	Tuesday
FNH	330	L2E	lab	MCML		20			13			1	1	2.0	-	2.0	Thursday
FNH	330	L2F	lab	MCML		22			13			1	1	2.0	-	2.0	Thursday
FNH	330	L2G	lab	MCML		25			13			1	1	2.0	-	2.0	Thursday
FNH	330	L2H	lab	MCML		22			13			1	1	2.0	-	2.0	Thursday
APBI	398	001	lecture	MCML	10			15			1		1	3.0	3.0	-	
APBI	222	001	lecture	MCML	18			20			1		1	3.0	3.0	-	
APBI	460	001	lecture	MCML	8			20			1		1	3.0	3.0	-	
APBI	318	001	lecture	MCML	21			25			1		1	3.0	3.0	-	Uses dry lab during lecture from time to time
APBI	290	001	lecture	MCML	29			30			1		1	3.0	3.0	-	
APBI	414	001	lecture	MCML	20			30		30	1		1	3.0	3.0	-	We need a decent seminar-style room for 30, to replace the disaster in the renovated 3rd floor MacMillan.
FNH	325	T01	tutorial	MCML				30			1		1	1.0	1.0	-	
Sub-Total															45.5	22.0	

Classroom Section Hours Workload - Continued

Course	Crse #	Sect,	Room Type	Current	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per	# Total Sched Hrs per Sect per	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
GRS	490	001	lecture	MCML	11	11		30	30		1	1	2	3.0	3.0	3.0	
APBI	398	002	lecture	ORCH		13			15			1	1	3.0	-	3.0	
APBI	265	001	lecture	FNH		22			25			1	1	3.0	-	3.0	
FNH	326		tutorial	MCML		30			30			1	1	1.0	-	1.0	
APBI	322	001	lecture	MCML		24			30			1	1	3.0	-	3.0	
APBI	412	001	lecture	FCS					30	30		1	1	3.0	-	3.0	Flexible flat floor
GRS	300	001	lecture	MCML		11			30			1	1	3.0	-	3.0	
FNH	330	001	lecture	MCML	186				30		1		1	2.0	2.0	-	
LWS	550	001	lecture	MCML	21	16			30			1	1	1.5	-	1.5	
LFS	252	T02	tutorial	MCML		17			20		2	1	3	1.0	2.0	1.0	will need to double lab sections for new section in term 1
LFS	252	T03	tutorial	MCML		21			20		1	1	2	1.0	1.0	1.0	
LFS	252	T04	tutorial	MCML		15			20		1	1	2	1.0	1.0	1.0	
LFS	252	T05	tutorial	MCML		19			20		1	1	2	1.0	1.0	1.0	
LFS	252	T06	tutorial	MCML		8			20		1	1	2	1.0	1.0	1.0	
LFS	252	T07	tutorial	MCML		21			20		1	1	2	1.0	1.0	1.0	
LFS	252	T08	tutorial	MCML		20			20		1	1	2	1.0	1.0	1.0	
LFS	252	T09	tutorial	MCML		19			20		1	1	2	1.0	1.0	1.0	
LFS	252	T10	tutorial	MCML		12			20		1	1	2	1.0	1.0	1.0	
LFS	252	T11	tutorial	MCML		6	6		20		1	1	2	1.0	1.0	1.0	
SOIL	517	001	lecture	MCML	4			14			1		1	3.0	3.0	-	
FOOD	520	001	lecture	FNH	15			20			1		1	3.0	3.0	-	
FOOD	521	002	lecture	FNH	16			20			1		1	3.0	3.0	-	
FOOD	522	001	lecture	FNH	9			20			1		1	3.0	3.0	-	
FOOD	525	002	lecture	FNH	23			25			1		1	3.0	3.0	-	
FOOD	529	002	lecture	FNH		14			14			1	1	3.0	-	3.0	
FOOD	515	001	lecture	FNH		23			25			1	1	3.0	-	3.0	
FOOD	523	001	lecture	FNH		23			25			1	1	3.0	-	3.0	
FOOD	524	001	lecture	WOOD		20			30			1	1	3.0	-	3.0	
FOOD	527A	001	lecture	FNH		27			30			1	1	3.0	-	3.0	
New PM Prog.			lecture			0			15		5	5	10	3.0	15.0	15.0	
LWS	501	T01	tutorial	MCML	20			30			1		1	3.0	3.0	-	Tables, flexibility for group work + plenary
LWS / SOIL	515	T01	tutorial	MCML	16			30			1		1	1.5	1.5	-	Tables, flexibility for group work + plenary
SOIL	500	002	seminar	MCML	10							1	1	1.5	-	1.5	Tables, flexibility for group work + plenary (e.g.
Total - Standard Classroom - 30-Seats															96.0	84.0	

Classroom Section Hours Workload – Continued

				CURRENT				FUTURE (2023/24)									
Course	Crse #	Sect,	Room Type	Current	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per	# Total Sched Hrs per Sect per	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Classroom -50 Seats																	
FRE	502	001	lecture	MCML	40			50			1		1	3.0	3.0	-	
FRE	516		lecture	MCML	39			50			1		1	3.0	3.0	-	
FRE	528	002	lecture	MCML	42		42	35			1		1	3.0	3.0	-	
FRE	501	001	lecture	MCML	40		40	50			1		1	3.0	3.0	-	
FRE	528	002	lecture	MCDL				50			1		1	3.0	3.0	-	
FRE	517	001	lecture	MCML		26			35			1	1	1.5	-	1.5	
FRE	523	001	lecture	MCML		18	18		35			1	1	1.5	-	1.5	
FRE	526	001	lecture	MCML		27			35			1	1	1.5	-	1.5	
FRE	527		lecture	MCML		11			35			1	1	1.5	-	1.5	
FRE	529	001	lecture	MCML		47	47		35			1	1	1.5	-	1.5	
FRE	530	001	lecture	MCML		31			35			1	1	1.5	-	1.5	
FRE	541	001	lecture	ORCH		13			35			1	1	1.5	-	1.5	
FRE	585		lecture	ORCH		66			35			1	1	3.0	-	3.0	
FRE	505	001	lecture	MCML		16			35			1	1	1.5	-	1.5	
FRE	515		lecture	MCML		30			35			1	1	3.0	-	3.0	
FRE	521D	001		PCOH		0			35			1	1	3.0	-	3.0	
FRE	521C		lecture	MCML		39			35			1	1	3.0	-	3.0	
FRE	522	001	lecture	MCML		19			35			1	1	1.5	-	1.5	
FRE	490	001	lecture	MCML	30			35			1		1	3.0	3.0	-	
LFS	150	005	lecture	SWNG	24		24	35			1		1	3.0	3.0	-	
APBI	410	002	lecture	MCML	28			40			1		1	3.0	3.0	-	It was taught at ORCH last year.
APBI / GEOB	244/204	L01/001	lecture	MCML	86			50			1		1	3.0	3.0	-	may be crosslisted with GEOB200
FNH	380	001	lecture	FNH	37			50			1		1	3.0	3.0	-	
FNH	415	001	lecture	MATX	83			50			1		1	3.0	3.0	-	
LFS	150	003	lecture	MCML	23			35			1		1	3.0	3.0	-	
APBI	260	001	lecture	MCML	39			48			1		1	2.0	2.0	-	
FNH	451	001	lecture	MCML	46			50				1	1	3.0	-	3.0	FNH 451 uses MCML 358 for activities involving the whole class. Otherwise, it breaks up into 6 groups using MCML 360B, D, F, H, K, and L.; Course will move to Term 2 in future offerings
FNH	470	001	lecture	FNH	35			50			1		1	3.0	3.0	-	
FNH	302		lecture + tutori	MCML	90			50			1		1	4.0	4.0	-	tables for tutorial
APBI	490	101	lecture	MCML	22			50	50		1		1	3.0	3.0	-	THIS WILL ALWAYS VARY DEPENDING ON THE TOPIC
GRS	390	001	lecture	MCML	28	28		50	50		1	1	2	3.0	3.0	3.0	
GRS	290	001	lecture	MCML	37	37		50	50		1	1	2	3.0	3.0	3.0	
FNH	335	001	lecture	MCML		35			35			1	1	2.0	-	2.0	
FNH	340	001	lecture	FNH	41	41			45			1	1	3.0	-	3.0	
APBI	360	001	lecture	MCML		34			50			1	1	3.0	-	3.0	
APBI	490	T01	lecture	MCLD		37			50			1	1	3.0	-	3.0	Term not shown
FNH	480	001	lecture	FNH		35			50			1	1	3.0	-	3.0	
FRE	420		lecture	MCML		35	35		50			1	1	3.0	-	3.0	
FRE	460		lecture	MCML		45			50			1	1	3.0	-	3.0	
FNH	335	L01	lab	MCML		35			40			1	1	1.0	-	1.0	needs food grade lab for winemaking
FNH	341	001	lab	FNH		21			50			1	1	3.0	-	3.0	needs kitchen prep for full class
CONS/APBI	495	201/001	lecture	FSC		18			50	50		0	-	3.0	-	-	Tiered with small group. FSC 2965 does NOT work for this class. WILL LIKELY NOT BE TAUGHT IN FUTURE BY LFS
Sub-Total															54.0	58.5	

Classroom Section Hours Workload – Continued

				CURRENT				FUTURE (2023/24)									
Course	Crse #	Sect,	Room Type	Current	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	# Students Enrolled in Crse	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per	# Total Sched Hrs per Sect per	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
FNH	475	001	lecture	SCRF		35			50			1	1	3.0	-	3.0	
LFS	450	001	lecture	MCML		30	30		50			1	1	3.0	-	3.0	
APBI/SOIL	403/503	001	lecture	MCML	32			40			1		1	3.0	3.0	-	
FOOD	512	002	lecture	SWNG	32			35			1		1	3.0	3.0	-	
FOOD	528	002	lecture	SWNG	31			40			1		1	3.0	3.0	-	
FRE	502	001	lecture	MCML	40			50			1		1	3.0	3.0	-	
FRE	516		lecture	MCML	39			50			1		1	3.0	3.0	-	
FRE	528	002	lecture	MCML	42		42	35			1		1	3.0	3.0	-	
FRE	501	001	lecture	MCML	40		40	50			1		1	3.0	3.0	-	
FRE	528	002	lecture	MCDL				50			1		1	3.0	3.0	-	
FRE	517	001	lecture	MCML		26			35			1	1	1.5	-	1.5	
FRE	523	001	lecture	MCML		18	18		35			1	1	1.5	-	1.5	
FRE	526	001	lecture	MCML		27			35			1	1	1.5	-	1.5	
FRE	527		lecture	MCML		11			35			1	1	1.5	-	1.5	
FRE	529	001	lecture	MCML		47	47		35			1	1	1.5	-	1.5	
FRE	530	001	lecture	MCML		31			35			1	1	1.5	-	1.5	
FRE	541	001	lecture	ORCH		13			35			1	1	1.5	-	1.5	
FRE	585		lecture	ORCH		66			35			1	1	3.0	-	3.0	
FRE	505	001	lecture	MCML		16			35			1	1	1.5	-	1.5	
FRE	515		lecture	MCML		30			35			1	1	3.0	-	3.0	
FRE	521D	001		PCOH		0			35			1	1	3.0	-	3.0	
FRE	521C		lecture	MCML		39			35			1	1	3.0	-	3.0	
FRE	522	001	lecture	MCML		19			35			1	1	1.5	-	1.5	
HUNU	631/531	01/003	seminar	FNH	40	15		45	45		1	1	2	1.0	1.0	1.0	
APBI	415	001	lecture	MCML		14			35	35		1	1	3.0	-	3.0	flexible flat floor, small groip
APBI	416	001	lecture	ORCH	33			34		40	1		1	3.0	3.0	-	A room like ORCH 1001 is good; tables and chairs move, multiple whiteboards
LFS	150	006	lecture	ORCH		30			35	30		1	1	3.0	-	3.0	This class worked extremely well in ORCH 4018 due to multiple whiteboards, technology at tables and moveable furniture.
Total - Standard Classroom - 50 Seats															82.0	97.0	

Classroom Section Hours Workload – Continued

					CURRENT			FUTURE (2023/24)									
Course	Crse #	Sect,	Room Type	Building	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse (2017 W2)	# Students Enrolled in Crse (2017)	# Students Enrolled in Crse (W1)	# Students Enrolled in Crse (W2)	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk W1+W2	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per Wk W1	# Total Sched Hrs per Sect per Wk W2	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Standard Classroom - 70 Seats																	
FNH	472	001	lecture	FNH	48			55			1		1	3.0	3.0	-	
FNH	440	001	lecture	FNH	35			60			1		1	3.0	3.0	-	
APBI	312	001	lecture	MCML	45			60			1		1	3.0	3.0	-	It was taught at Forestry last year.
FNH	341	002	lab	FNH		20		70				1	1	3.0	-	3.0	needs kitchen prep for full class
FNH	300	001	lecture	MCML	45			60			1		1	3.0	3.0	-	
FNH	301	001	lecture	FSC	45		45	60			1		1	3.0	3.0	-	
FNH	405	001	lecture	FNH		61		60				1	1	3.0	-	3.0	
FNH	300	T01	tutorial	MCML	45			60			1		1	1.0	1.0	-	tables
FNH	440	T01	tutorial	FNH	35			60			1		1	1.0	1.0	-	
APBI/BIOL	328/317	001	lecture	FSC	60				65	65	1		1	3.0	3.0	-	Numbers include students for BIOL 317 also. APBI 328 and BIOL 317 are cross listed courses.
FNH	309	T01	tutorial	WESB		81			70			1	1	1.0	-	1.0	tables needed
APBI / LWS / SOI	401/501	001	lecture	MCML	39			60			1		1	3.0	3.0	-	Course had 50 students in 2018
APBI	413	001	lecture	MCML	47			60		60	1		1	3.0	3.0	-	Active Learning, flexible small group
FNH	303	001	lecture	MCML		46	46		60			1	1	3.0	-	3.0	Active Learning, flexible small group
APBI/SOIL	402/502	001	lecture	ORCH		25			60			1	1	1.0	-	1.0	Course had 50 students in 2018; group work + plenary; small group technology (scale up type) e.g. similar to ORCH 3018
APBI/SOIL	402/502	T01	tutorial	ORCH		24			60			1	1	2.0	-	2.0	Course had 50 students in 2018; group work + plenary; small group technology (scale up type) e.g. similar to ORCH 3018
FNH	301	T01	tutorial	FSC	45			60		60	1		1	1.0	1.0	-	Tiered with small group. FSC 2965 does NOT work for this class.
APBI	314	003	lecture	MCML		40			70	70		1	1	3.0	-	3.0	MacM 158 isn't ideal because the tables are bolted to the flat floor - makes it hard for small group discussions. A room with more flexibility in terms of seating would be preferable - or, a room like MacM 160 which is tiered.
Total - Standard Classroom - 70 Seats															27.0	16.0	
Standard Classroom - 100 Seats																	
FNH	403	T01	tutorial	FNH	81			75			1		1	1.0	1.0	-	needs tables
FRE	302	001	lecture	MCML		55			75			1	1	3.0	-	3.0	
FNH	477	001	lecture	MCML		73			80			1	1	3.0	-	3.0	
FNH	309	001	lecture	WESB		81			70			1	1	3.0	-	3.0	
FNH	455	001	lecture	FNH		68			75			1	1	3.0	-	3.0	
FNH	473	001	lecture	MCML		67			80			1	1	3.0	-	3.0	
FNH	474	002	lecture	FSC		77			80			1	1	3.0	-	3.0	
FRE	306	001	lecture	WESB	71			85			1		1	3.0	3.0	-	
FRE	340	001	lecture	FSC	76			85			1		1	3.0	3.0	-	
GEOB/APB	204/244	L01/001	lecture	MCML	86			85			1		1	3.0	3.0	-	
FNH	403	001	lecture	FNH	83			85			1		1	3.0	3.0	-	needs tables
FNH	402	001	lecture	FNH		84		100				1	1	3.0	-	3.0	
FNH	413	001	lecture	FNH	50			100			1		1	3.0	3.0	-	
APBI	315	001	lecture	MCML		67			100	100		1	1	3.0	-	3.0	Course changed to a large enrolment course in 2018 to accommodate interest; a wide, shallow, slightly tiered room like MCML 160 but for 100 or 120 students required.
BIOL/APBI	327	L01/001	lecture	MCML	101			120			1		1	3.0	3.0	-	
FNH	398	001	lecture	BUCH	147				90		1		1	3.0	3.0	-	
FNH	313	001	lecture	MCML		83			100			1	1	3.0	-	3.0	
Total - Standard Classroom - 100 Seats															22.0	27.0	

Classroom Section Hours Workload – Continued

					CURRENT			FUTURE (2023/24)									
Course	Crse #	Sect,	Room Type	Current Building	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse (2017 W2)	# Students Enrolled in Crse (2017)	# Students Enrolled in Crse (W1)	# Students Enrolled in Crse (W2)	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Total Req. Sect. per Wk W1+W2	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per Wk W1	# Total Sched Hrs per Sect per Wk W2	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w/ small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Standard Classroom - 160 Seats																	
FNH	200	102	lecture	SWNG	77			125			1		1	3.0	3.0	-	
FNH	250	001	lecture	PHRM	122			125			1		1	3.0	3.0	-	
FRE/COMI	295	l01/103	lecture	ANGU	130			135			1		1	3.0	3.0	-	
FRE/COMI	295	102	lecture	ANGU	128			135			1		1	3.0	3.0	-	
FRE/COMI	295	105	lecture	ANGU	126			135			1		1	3.0	3.0	-	
FRE/COMI	295	106	lecture	ANGU	122			135			1		1	3.0	3.0	-	
FNH	342	001	lecture	MCML	68	-		150			1		1	3.0	3.0	-	
LFS	350	001	lecture	FNH	136		136	150			1		1	3.0	3.0	-	
LFS	350	001	lecture	FNH	136			150			1		1	3.0	3.0	-	
LFS	350	001	lecture	MCML	136			150			1		1	3.0	3.0	-	
LFS	350	001	lecture	MCML	136			150			1		1	3.0	3.0	-	
LFS	350	002	lecture	MCML		126	126		150			1	1	3.0	-	3.0	
LFS	350	002	lecture	FNH		126			150			1	1	3.0	-	3.0	
FNH	380	T01	tutorial	FNH	37				150		1		1	3.0	3.0	-	
		103	lecture	MCML		159			125			1	1	3.0	-	3.0	
		002	lecture	MCML		126			150			1	1	3.0	-	3.0	
		002	lecture	FNH		126			150			1	1	3.0	-	3.0	
FNH	350	001	lecture	MCML	139		139		160		1		1	3.0	3.0	-	
Total - Standard Classroom - 160 Seats															39.0	15.0	
190- Seat Classroom																	
FNH	371	001	lecture	FSC	161	-		175			1		1	3.0	3.0	-	
FRE/ECOM	374	001	lecture	MCML	164			175			1		1	3.0	3.0	-	
FNH	370	001	lecture	HENN	118	-			175		1		1	3.0	3.0	-	
APBI	200	001	lecture	MCML		130			180			1	1	3.0	-	3.0	large lecture style with some tables upfront (e.g. Hennie), multiple screens
APBI	200	002	lecture	SWNG		121			180			1	1	3.0	-	3.0	large lecture style with some tables upfront (e.g. Hennie), multiple screens
Total - 190-Seat Classroom															9.0	6.0	
250-Seat Classroom																	
APBI	314	001	lecture	MCML	71	-		200		200	1		1	3.0	3.0	-	Course changed to a large enrolment course in 2018 to accommodate interest; MCML166 is adequate, but a wider, shallower format could solve problems of students being unable to hear each other in whole-group discussion.
FNH	200	101	lecture	MCML	176	-		200			1		1	3.0	3.0	-	
LFS	100	001	lecture	ESB	290			200			1		1	1.0	1.0	-	
FNH	330	002	lecture	MCML		184		200				1	1	2.0	-	2.0	
LFS	100	002	lecture	FNH	56			200			1		1	1.5	1.5	-	
FNH	351	001	lecture	SWNG	0	156		250			0	1	1	3.0	-	3.0	
LFS	252	002	lecture	ESB		200.00			220			1	1	3.0	-	3.0	
LFS	252	002	lecture					220			1		1	3.0	3.0	-	
FNH	355	001	lecture	MCML	199				250		1		1	3.0	3.0	-	
FNH	355	002	lecture	SCRF	207	207			250			1	1	3.0	-	3.0	
Total - 250-Seat Classroom															14.5	11.0	
400- Seat Classroom																	
LFS	250	001	lecture	ESB	310	310		400	400			1	1	3.0	-	3.0	Term not shown
Total - 400-Seat Classroom															-	3.0	

2. Teaching Lab Section Hours Workload

The following table includes existing and future (2023/24) course and section hour information for Teaching Lab sections delivered within the MacMillan Building.

				CURRENT			FUTURE (2023/24)								
	Crse	Section	Required Room Type	Current Building	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse (2017 W2)	# Students Enrolled in Crse (W1)	# Students Enrolled in Crse (W2)	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per Wk W1	# Total Sched Hrs per Sect per Wk W2	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w / small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Soils Lab															
APBI	200	L01	lab	MCML		30		30			1	2.0	-	2.0	SOIL LAB - Uses Room 102A for teaching. Labs require 5 hours setup and 5 hours take dow n. Additional prep w ork betw een labs occurs in research w et lab currnetly (room 120)
APBI	200	L02	lab	MCML		26		30			1	2.0	-	2.0	10 hours per w eek office hours held in lab.
APBI	200	L03	lab	MCML		29		30			1	2.0	-	2.0	Lab requires projector
APBI	200	L04	lab	MCML		30		30			1	2.0	-	2.0	Requires a w et lab space
APBI	200	L05	lab	MCML		30		30			1	2.0	-	2.0	Flexible floor plan is required (eg renovated MCML102A)
APBI	200	L06	lab	MCML		17		30			1	2.0	-	2.0	Requires equipment and chemical storage - currently in Rooms 118B, 112E, 112B, 102D
APBI	200	L07	lab	MCML		29		30			1	2.0	-	2.0	
APBI	200	L08	lab	MCML		30		30			1	2.0	-	2.0	Requires display of soil monoliths
APBI	200	L09	lab	MCML		30		30			1	2.0	-	2.0	
APBI	200	L10	lab	MCML		0		30			1	2.0	-	2.0	
APBI	200	L11	lab	MCML		0		30			1	2.0	-	2.0	New section to accommodate grow th
APBI	200	L12	lab	MCML		0		30			1	2.0	-	2.0	New section to accommodate grow th
APBI	222	L01	lab	MCML	18		25			1		3.0	3.0	-	Labs in MCML greenhouse & field trips; requires equipment and supplies storage (currently in Room 34); if the Greenhouses are not available, this needs space in MCML; depending on scheduling this w ould be appropriate for the Soils Lab 102A
APBI	322	L01	lab	MCML		24		30			1	3.0	-	3.0	See note above
GEOB/APBI	204/244	L01	lab	MCML	18		25			1		3.0	3.0	-	APBI 244 Lab may no longer be given or may be scheduled into MCML 102A
GEOB/APBI	204/244	L02	lab	MCML	19		25			1		3.0	3.0	-	
GEOB/APBI	204/244	L03	lab	MCML	16		25			1		3.0	3.0	-	
GEOB/APBI	204/244	L04	lab	MCML	15		25			1		3.0	3.0	-	
GEOB/APBI	204/244	L05	lab	MCML	18		25			1		3.0	3.0	-	
APBI / SOIL	403/503	L01	lab	MCML		32		35			1	3.0	-	3.0	Lab requires 2. 5 hours setup + 2.5 hours clean up per w eek; requires a w et lab space; limit class size based on safety and supervison. Flexible floor plan is required (eg renovated MCML102A); requires equipment and chemical storage - currently in Rooms 118B, 112E, 112B, 102D; additional prep w ork betw een labs occurs in research lab; requires vibration free bench for scales
													18.0	30.0	

Teaching Lab Workload Table Continued

					CURRENT			FUTURE (2023/24)								
	Crse	Section	Required Room Type	Current Building	# Students Enrolled in Crse (2017 W1)	# Students Enrolled in Crse (2017 W2)	# Students Enrolled in Crse (W1)	# Students Enrolled in Crse (W2)	Max. Sect Size of Crse	# Req. Sect. per Wk W1	# Req. Sect. per Wk W2	# Sched Hrs per Sect per Wk	# Total Sched Hrs per Sect per Wk W1	# Total Sched Hrs per Sect per Wk W2	Remarks: Indicate type e.g., flexible flat floor, tiered, tiered w / small group, small group technology (SCALE-UP type), access to small group rooms, openable/expandable for seminars
Wet Lab - Microbiology															
FNH	325	001	wet lab	MCML	27		30			1		3.0	3.0	-	Requires 4 hr set up
FNH	325	T01	tutorial	MCML						1		1.0	1.0	-	Tutorial held in Lab
FNH	326		wet lab	MCML		30		30			1	4.0	-	4.0	Requires 4 hr set up
FNH	425		wet lab	MCML				30		1	1	4.0	4.0	4.0	
FOOD	520	L01	wet lab	MCML	13		13			1		3.0	3.0	-	
APBI	417	L01	wet lab	MCML	9		9		20	1		3.0	3.0	-	Future uncertain; Currently in room 342; could be scheduled in MCML240
APBI /FRST	342/ 310		wet lab	MCML		30		40			2	3.0		6.0	
APBI	New		wet lab	MCML			30			1		3.0	3.0	-	New Animal Physiology Lab; w ould be scheduled into FNH 240 equivalent
APBI	New		wet lab	MCML			30			1		3.0	3.0	-	New Animal Physiology Lab; w ould be scheduled into FNH 240 equivalent
FNH	New			MCML			30			1		3.0	3.0	-	By 2023 there w ill be a new FNH Lab - currently offered in MCML 240
													23.0	**14.0**	
Dry Lab															
BIO/APBI	327	L01	dry lab	MCML	27		27			1		2.0	2.0	-	
BIO/APBI	327	L02	dry lab	MCML	26		26			1		2.0	2.0	-	
BIO/APBI	327	L03	dry lab	MCML	24		24			1		2.0	2.0	-	
BIO/APBI	327	L04	dry lab	MCML	24		24			1		2.0	2.0	-	
FNH	330		lab	MCML						1	1	2.0	2.0	2.0	
FNH	335		lab	MCML							1	2.0	-	2.0	
													10.0	**4.0**	
Computer Lab															
LFS	400	L01	computer	MCML		18					1		-	1.5	
LFS	400	001	lecture	MCML		18		20			1	3.0	-	3.0	lab requires computers / Learnng Centre access for audio equipment
LFS	252	T01	tutorial	MCML		21		20		1	1	1.0	1.0	1.0	labs held in computer lab McML 192
FRE	501	L01	computer	MCML	40		50			1		1.5	1.5	-	
FRE	501	L01	computer	MCML	40		50			1		1.5	1.5	-	
FRE	528	L02	computer	MCML	42		50			1		1.0	1.0	-	
FRE	528	L02	computer	MCML	42		50			1		1.0	1.0	-	
FRE	585	L01	computer	MCML		65		75			1	1.0	-	1.0	
FRE	585		computer	MCML		65		35			1	1.0	-	1.0	Moved from Classrooms
Total													**6.0**	**7.5**	
Pilot Plant															
FNH	325	001	wet lab	WESB	27		30			1		3.0	-	-	2 day demonstration lab
FNH	326		wet lab	WESB		30		30			1	4.0	-	-	2 day demonstration lab
FNH	425		wet lab	WESB				30		1	1	4.0	-	-	Student Projects w ithin Pilot Plant
FOOD	524	L01	lab	WESB		16					1	4.0	-	-	Lab occurs over 2 days
FNH	309		demo	WESB											
Total													**0.0**	**0.0**	

Appendix C – Formula Analysis

APPENDIX C – FORMULA ANALYSIS

This table below is a Formula Analysis (based on the B.C. Universities Space Manual, date 2/27/03) for the Faculty of Land and Food Services research and office space components included in the Master Program. Where applicable, the table summarizes full time equivalent (FTE) inputs and the various factors assigned to the inputs from the Manual. In all cases, factors are in terms of net square metres (NSM).

For reference and where applicable, the Formula Analysis generates "maximum acceptable" area allocations for various space types. In all cases, space programming to be used to generate actual space requirements, provided these requirements do not exceed the Formula Analysis.

Note: category 1.0 Classrooms not applicable.

LAND FOOD SYSTEMS						**NSM**	***Notes/Assumptions***
2.0 Teaching	Lab WSCH	*Factor*					
Group W	1,554	*0.7*				1,088.0	*Lab WSCH (teaching laboratory weekly student contact hours based on detailed future (year 2023/24) teaching lab course workload information included as Appendix C as provided by LFS representatives. Note: Lab WSCH is the average of future W1 and W2*
3.0 Research	FTE Faculty	*Factor*	FTE Grads + Research Staff	*Factor*			
Group A	18.0	*34.5*	138.0	*17.3*		3,008.4	*Incl. future year 2023/24 FTE research faculty, research graduate students (masters, PhD), research staff. Excludes:* - *Faculty: lecturers, instructors, directors/faculty of professional programs, associate member, adjunct professor, affiliate professor, sessional, active emeriti, computational thinking course developer* - *Graduate Students: professional programs*
4.0 Academic Office			FTE	*Factor*			
Faculty Area			23.0	*17.3*		397.9	*Incl. future (year 2023/24) FTE faculty, faculty other and excludes: faculty associate member, adjunct professor,*

LAND FOOD SYSTEMS			**NSM**	***Notes/Assumptions***
				affiliate professor, sessional, active emeriti
Faculty Supplemental Area	23.0	*2.6*	59.8	*As above.*
Graduate Student Area	98.0	*5.3*	519.4	*Incl. future (year 2023/24) research graduate students (Masters, PhD and excludes professional programs graduate students*
Non-Academic Staff Area	43.0	*17.3*	743.9	*Incl. future (year 2023/24) administration, tech group.*
Subtotal			1,721.0	
Total			5,817.4	