Pacific Institute for the Mathematical Sciences

2016 Foundational Methods in Computer Science

Pacific Institute for the Mathematical Sciences
Earth Sciences Building
2207 Main Mall- UBC

Getting Started

Get connected: Select the "ubcvisitor" wireless network on your wireless device. Open up a web browser, and you will be directed to the login page.

Frequently Asked Questions

Q: Where do I check in on the first day?

Check- in and Package pick up can be done in the Atrium

Q: Where are the sessions?

All workshop sessions in the Earth Sciences Building Room 2012

Q: Will the program change?

Program changes and updates will be announced at each session.

Q: When should I wear my badge?

Please wear your name badges at all times on site so that PIMS Staff recognize you as a guest.

Q: Where can I go for help on site?

If you need assistance or have a question during the conference, please feel free to talk to one of the organizers

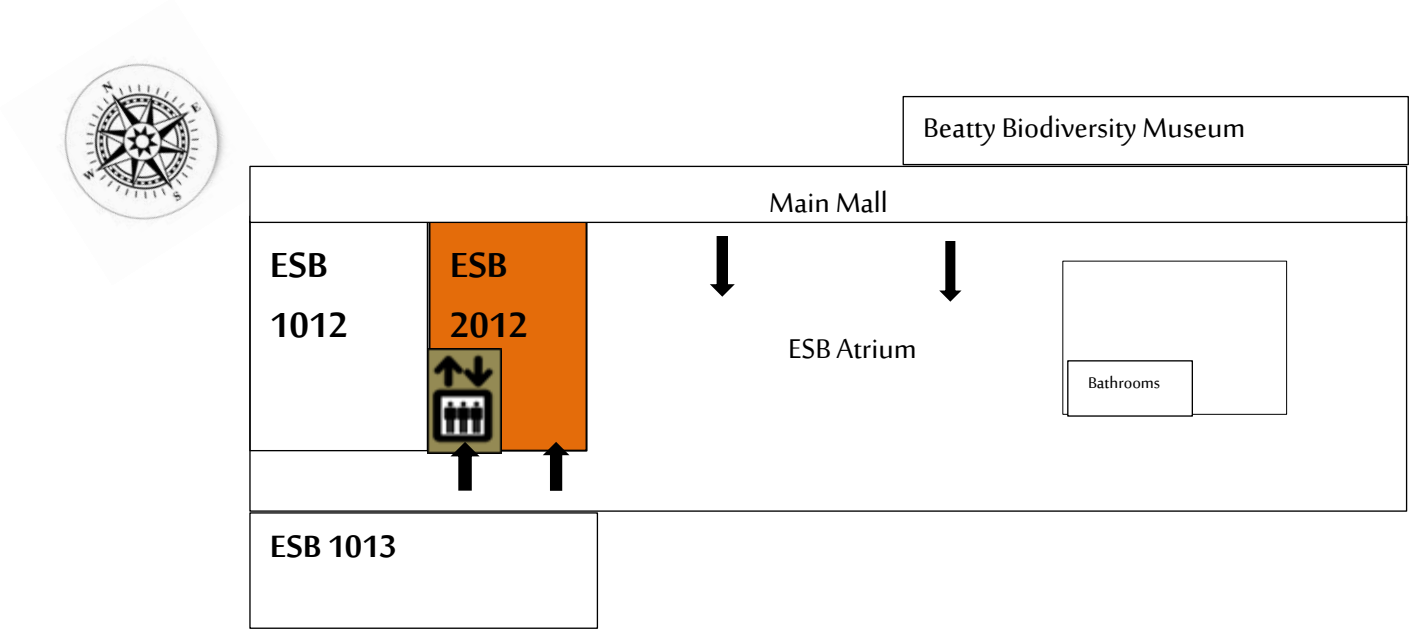
Q: Where can I get refreshments and meals?

For snack or quick meals, please view the list of UBC eateries attached at the end of the program; otherwise the workshop will provide morning coffee and pastries and afternoon coffee breaks

Q: Where can I get directions for campus and the building?

You will find a copy of the building floor on page 3 and a campus map at the end of the program

Conference Room Guide: Earth Science Bldg 2207 Main Mall



General Travel Directions:

UBC Map link: http://www.maps.ubc.ca/PROD/images/pdf/ubcmap.pdf

Airport to UBC: Easiest by taxi (25min, around $30). If your accommodation is at Walter H Gage Towers, please give them the address: *5959 Student Union Boulevard, UBC*. By public transport, take the Canada Line (rail) to Broadway-City Hall station. From Broadway-City Hall station, cross Broadway and Cambie streets to get to the #99 UBC bus stop in front of London Drugs. Tickets (valid for the whole journey to UBC) can be purchased from the machine in the airport station. Cost: approximately $6. Journey time: Circa more than 1 hour

UBC Bus Loop/ Gage to Earth Science Building (ESB) 2207 Main Mall: A quick 10min walk. See UBC map. Head west past the student union building, cross East Mall and get onto Main Mall. Turn left (South) on Main Mall and Earth Science Building will be on your right after a few minutes. It is a large new building, and is on Main Mall directly across from the Beatty Biodiversity Centre and prominent blue whale skeleton.

Public Transit: Feel free to search and plan your public transport rides by visiting http://www.translink.ca/, where directions, ticket costs and bus schedules are indicated.

Parking at UBC: http://www.parking.ubc.ca/visitor.html

Thursday June 2, 2016

Noon Onwards	Check into accommodation on campus.
4: 00pm – 6:30pm	Networking Reception and Welcome at PIMS Office
	2207 Main Mall, 4th floor. Please take the elevator; ring the bell.

Friday June 3, 2016

9:00am - 10:30 am	**Ernie Manes**, University of Massachusetts
	Pre-monads and their algebras
10:30am - 11:00am	Coffee break (ESB 2012 Lobby)
11:00am - 12:30pm	**Jamie Vicary**, University of Oxford
	An introduction to Globular
12:30pm - 2:00pm	Lunch (See List of UBC Eateries attached at the end of the program)
2:00pm - 2:30pm	**Phil Mulry**, Colgate University
	Results on distributive and near-distributive laws
2:30pm - 3:30pm	**Geoff Cruttwell**, Mount Allison University
	The usefulness of double categories
3:30pm - 4:00pm	Coffee break (ESB 2012 Lobby)
4:00pm - 5:30pm	**Dorette Pronk**, Dalhousie University
	Orbifold mapping spaces
5:30pm - 6:00pm	**Alanod Sibih**, Dalhousie University
	A new notion of equivalences for Orbifold atlases

Saturday June 4, 2016

9:00am - 10:00am	**Vaughan Pratt**, Stanford University
	Model complexity of natural phenomena, by analogy with computational complexity
10:00am - 10:30am	**Ben MacAdam,** University of Calgary
	Fermat theories are Cartesian differential categories
10:30am - 11:00am	Coffee break (ESB 2012 Lobby)
11:00 am - 11:30 pm	**JS Lemay**, University of Calgary
	Integral categories
11:30 pm - 12:00pm	**Lucius Schoenbaum**, Louisiana State University
	A generalization of Topos theory
12:00pm - 12:30pm	**Darien DeWolf**, Dalhousie University
	Restriction monads and category objects
12:30pm - 2:00pm	Lunch (See List of UBC Eateries attached at the end of the program)
2:00pm - 2:25pm	**Jonathan Gallagher**, University of Calgary
	Computable structures in Operads
2:25pm - 2:50 pm	**Prashant Kumar**, University of Calgary
	Concurrent abstract machines
2:50pm - 3:30pm	**Rory Lucyshyn-Wright**, Mount Allison University
	Enriched algebraic theories, monads, and commutants
3:30pm - 4:00pm	Coffee break (ESB 2012 Lobby)
4:00pm - 4:25pm	**Chad Nester**, University of Calgary
	Realizability and Turing categories
4:25pm - 4:50pm	**Priyaa V. Srinivasan**, University of Calgary
	Structure of quantum information resource theories
5:45pm	Meet up in front of Walter H Gage Towers for pickup to dinner/entertainment
	(If you have a car and are willing to drive a few participants to the dinner/entertainment venue to help everyone get there faster, then please contact maret723@gmail.com)
6:30pm	Conference dinner/ entertainment: 455 East 17th Avenue

Sunday June 5, 2016

9:00am - 9:45am	**Bob Rosebrugh**, Mount Allison University
	Spans of edit lenses
9:45am - 10:30 am	**Laura Scull**, Fort Lewis College
	The Orbifold Construction
10:30am - 11:00am	Coffee break (ESB 2012 Lobby)
11:00am - 11:45am	**Jamie Vicary:** University of Oxford
	Coherence for Frobenius pseudomonoids and 3d proof nets
11:45pm - 1:00pm	**Robin Cockett**, University of Calgary
	Discrete inverse categories
1:00pm - 1:30pm	**Chris Dutchyn**, University of Saskatchewan
	Symmetric Lambda Calculus
1:30pm – 1:35pm	C**oncluding remarks and departures**
	Evaluation Survey: Please fill in the online participant survey for this event at http://www.pims.math.ca/scientific-event/160602-fmcs

Participant List

1. Robin Cockett, University of Calgary
   Calgary, Alberta
2. Geoff Cruttwell, Mount Allison University
   Sackville, New Brunswick
3. Robert Dawson, St. Mary's University
   Halifax, Nova Scotia
4. Darien DeWolf, Dalhousie University,
   Halifax, Nova Scotia
5. Chris Dutchyn, University of Saskatchewan
   Saskatoon, Saskatchewan,
6. Jonathan Gallagher, University of Calgary
   Calgary, Alberta
7. Prashant Kumar, University of Calgary
   Calgary, Alberta
8. JS Lemay, University of Calgary
   Calgary, Alberta
9. Rory Lucyshyn-Wright, Mount Allison University
   Sackville, New Brunswick
10. Ben MacAdam, University of Calgary
    Calgary, Alberta
11. Lauchie MacDonald, University of British Columbia
    Vancouver, British Columbia
12. Ernie Manes, University of Massachusetts
    Amherst, Massachusetts
13. Phil Mulry, Colgate University
    Hamilton, New York
14. Chad Nester, University of Calgary
    Calgary, Alberta
15. Vaughan Pratt, Stanford University
    Palo Alto, California
16. Dorette Pronk, Dalhousie University
    Halifax, Nova Scotia
17. Bob Rosebrugh, Mount Allison University
    Sackville, New Brunswick
18. Daniel Satanove, University of British Columbia
    Vancouver, British Columbia
19. Lucius Schoenbaum, Louisiana State University
    Baton Rouge, Louisiana
20. Laura Scull, Fort Lewis College
    Durango, Colorado
21. Robert Seely, John Abbott College
    Ste Anne de Bellevue, Quebec
22. Alanod Sibih, Dalhousie University
    Halifax, Nova Scotia
23. Priyaa Varshinee Srinivasan , University of Calgary
    Calgary, Alberta
24. Jamie Vicary, Oxford University
    Oxford, U.K.

Titles and Abstracts:

Robin Cockett, University of Calgary: *Discrete inverse categories*

Inverse categories play a key role in the semantics of reversible computation which in turn is a key component of quantum computation. This talk discusses some key aspects of the theory of inverse categories as they are applied to the semantics of these sorts of computation. An inverse category cannot have products or coproducts, however, it can have the "residual structure" of products and coproducts. An inverse category with "residual products", called an inverse product, is a discrete inverse category. The main structural theorem governing discrete inverse categories says that there is an equivalence between the category of discrete inverse categories and the category of Cartesian restriction categories with meets. This was one of the main result of Brett Giles's thesis (2014).

Inverse products on an inverse category are given by a symmetric tensor together with a natu=al diagonal map which turns each object coherently into a separable Frobenius semialgebra (i.e. separable Frobenius algebra with no units). An inverse product is structure rather than a property of an inverse category, thus, a given inverse category could carry more than one inverse product structure. The talk will describe the theory of discrete inverse categories and explore some well-known -- but perhaps not so well understood examples -- of discrete inverse categories.

Geoff Cruttwell, Mount Allison University: *The usefulness of double categories*

TBC

Darien DeWolf, Dalhousie University: *Restriction monads and category objects*

Defining restriction categories internal to some other category is useful in studying double restriction categories. The data required in such a structure can be better understood via restriction monads, which will be introduced in this talk.

Chris Dutchyn, University of Saskatchewan: *Symmetric Lambda Calculus*

TBC

Jonathan Gallagher, University of Calgary: *Computable structures in Operads*

The goal of this talk is to characterize categories of computable maps that arise from various extensions of BCI algebras. The most important aspect of these categories is latent structure; this is structure that arises when we split the idempotents of a category of computable maps. We will show how to add elements to a BCI algebra to obtain monoidal or classical (cartesian) structure. We will also see how to obtain, more generally, an endofunctor on the category of computable maps. Ultimately our goal is to obtain a combinatory algebra that provides the internal logic of a linear Turing category.

Prashant Kumar, University of Calgary: *Concurrent abstract machines*

MPL is a concurrent programming language with message passing as the concurrency primtive. In this talk we will look at the steps in the implementation of MPL with the main focus being on the abstract machine forMPL. Abstract machines are useful tools in developing programming languages.The abstract machine for MPL acts as the target to which MPL programs compile to. This abstract machine can be thought to be composed of two modular abstract machines, sequential and concurrent.
As the names suggest, they respectively act as targets for the sequential and concurrent code of MPL. We will mainly focus on the novel aspects of this abstract machine, namely support for codata in the sequential abstract machine and a description of the concurrent abstract machine. The concurrent abstract machine is conceptually an elegant machine as it elucidates how concurrency can be achieved using very few primitives and also provides the basis for the development of intuitive concurrent programs. We will show these features of the abstract machine with programs of varying degrees of complexity. We will briefly touch on the other steps in the implementation of MPL. We will look at the core language which acts as an intermediate stage in compilation of MPL programs to abstract machine programs. We will briefly look at the issues of type inferencing, compiling pattern matching and lambda lifting.

JS Lemay, University of Calgary: *Integral categories*

The two fundamental theorems of calculus tie together key concepts of calculus and analysis: differentiation and integration. One would hope that category theory would be able formalize differentiation, integration so that the fundamental theorems hold. Blute, Cockett and Seely introduced the notions of both monoidal differential categories and Cartesian differential categories, which formalize the concept of differentiation by axiomatizing a structure on a category using the rules of differentiation. Differentiation in category theory has now been extensively studied, the other side of the story, integration, has not received so much attention.
In this talk, we will introduce both monoidal integral categories and Cartesian integral categories, whose axioms include the substitution rule, the integration by parts rule and the integral formulas for polynomials. When either of these integral structures is compatibly mixed with the appropriate differential structure, we obtain an integral-differential category, in which both of the fundamental theorems of calculus hold.
This research work is done with Professors Kristine Bauer and Robin Cockett from the University of Calgary and Professor Richard Blute from the University of Ottawa.

Rory Lucyshyn-Wright, Mount Allison University: *Enriched algebraic theories, monads and commutants*

It was noted in Linton's 1965 work that arbitrary monads on the category of sets are equivalently described as Linton's equational theories, which are similar to Lawvere's algebraic theories except that the arities of operations can be arbitrary sets rather than just finite cardinals. This generalizes to an equivalence between V-enriched monads (or strong monads) on a symmetric monoidal closed category V and Dubuc's V-theories, wherein the arities are arbitrary objects of V. Subsequent work has considered V-enriched algebraic theories in which the arities are required to be finite in some sense. In work of Borceux

and Day, the arities are discrete finite cardinals (or equivalently, finite copowers of the unit object in V), and in work of Power the arities are finitely presentable objects in V.
In this talk, we discuss the speaker's recent work on V-enriched J-algebraic theories, where J is a specified system of arities in V, noting that these J-theories include all of the above examples and more. We study the questions of existence and characterization of V-categories of T-algebras for J-theories T. We establish an equivalence between J-theories and certain V-monads on V, which we call J-ary monads. We introduce a natural condition on the system of arities J that supports several aspects of the theory. Calling such systems eleutheric, we characterize them in terms of the notion of free cocompletion with respect to a class of weights. We study notions of commutation and commutativity for J-theories. We define a notion of commutant for J-theories and J-ary monads, generalizing Wraith's notion of commutant for Lawvere-Linton theories as well as the notion of centralizer of a subring. We establish existence results for commutants, and we show that the notion of commutant gives rise to a `self-adjoint' contravariant functor on theories over a base. We reconcile the notion of commutation in J-theories with Kock's notion of commutation of cospans of monads and, in particular, the notion of commutative strong monad. We discuss the relation of commutants to both the notion of codensity monad and the notion of algebraic structure in the sense of Lawvere.

Ernie Manes, University of Massachusetts: *Pre-monads and their algebra*
This tutorial is in the spirit of Richard Bird's 1987 paper. "Introduction to the theory of lists" with continued emphasis on programming issues but with more emphasis on the idea that lists form a monad for which the theory of its algebras (which are all semigroups) plays a role in understanding related constructions. Those wishing to review the relevant semigroup theory should look at Green's relations and Clifford's characterization of unions of groups. The list monad has many useful modifications which are only pre-monads (that is, they do not satisfy the monad laws). Most pre-monads have a monad approximation. Work with Phil Mulry on monad composition generalizes to near distributive laws. Certain near distributive laws relate to issues studied in topological semigroup theory.

Ben MacAdam, University of Calgary: *Fermat theories are Cartesian differential categories*
Cartesian differential categories and Fermat theories are both axiomatizations of smooth functions in a Cartesian space. In this talk we introduce both theories, and prove that Fermat theories are cartesian differential categories. We also provide a counterexample to the converse statement by showing the Cartesian differential structure of the differential lambda calculus does not conservatively embed into a Cartesian differential category whose differential structure is given by a Fermat theory. We conjecture there is a similar relationship between Fermat theories, generalized to partiality, and differential restriction categories.

Phil Mulry, Colgate University: *Results on distributive and near-distributive laws*
Composing monadic data types via distributive laws can be an important tool in both the theory and practice of computer science. Unfortunately finding cases of such laws can often prove elusive, particularly when looking for systematic approaches.

In this talk we will detail past and present efforts in this direction including near-distributive laws. This is joint work with Ernie Manes.

Chad Nester, University of Calgary: *Realizability structures and Turing categories*
Associated with every partial combinatory algebra is its realizability topos. This can be constructed either through tripos theory, or by completing the relevant category of assemblies to a topos. Both of these constructions make heavy use of the machinery in the category of sets and partial maps. Using Turing categories, a more abstract presentation of partial combinatory algebras, we can perform the above constructions of the realizability topos in more generality, replacing partial functions on sets with an appropriate restriction category. Note that this is a work in progress, and as such many details are missing!

Vaughan Pratt, Stanford University: *Model complexity of natural phenomena, by analogy with computational complexity*
The complexity of a class of problems measures the difficulty of answering a question as a function from size of problem and desired precision to resources necessary and/or sufficient to answer it. We propose model complexity as a function from size of datasets and desired precision to number of parameters of a model necessary and/or sufficient
to answer it. We apply this methodology to some simple models of global climate change since 1850, and estimate their forecasting skill to 2100.

Dorette Pronk, Dalhousie University: *Orbifold mapping spaces*
We will consider orbifolds as represented by proper etale groupoids in the category of smooth/topological manifolds (and I will explain briefly how to obtain this presentation). To obtain the maps between orbifolds one takes a bicategory of fractions with respect to essential equivalences of groupoids. Maps are the given by certain spans of groupoid maps and equivalences of 2-cell diagrams between them. We will study the structure of the groupoids obtained by taking these spans as objects and these 2-cells as arrows. In particular, we will see that they are again proper etale groupoids, although the spaces of objects and arrows may become infinite dimensional. The category theory needed to obtain this result involves a nice result about mapping objects in a bicategory of fractions C[W^{-1}] as pseudo colimits of mapping objects in the original 2- or bicategory C. I will present this result in detail.

Bob Rosebrugh, Mount Allison University: *Spans of edit lenses*
Asymmetric lenses provide an operational strategy to lift updates of view states in a model domain (solving the "view update problem"). Examples of a model domain include sets, orders and categories. A symmetric lens between two model domains incorporates both data for state synchronization and operations for resynchronization after updates. (Certain equivalence classes of) symmetric lenses compose to give a category SLens. In previous work we showed in a variety of domains that (certain equivalence classes of) spans of asymmetric lenses represent morphisms of SLens, and we obtained an equivalence of categories.

What they called "edit lenses" were introduced and studied more recently by Hofmann, Pierce and Wagner. Edit lenses are similar to category-based symmetric lenses, but have updates restricted to a fixed monoid of "edits". They were studied in the symmetric case only. We have now defined an appropriate notion of asymmetric edit lens and found a representation of (symmetric) edit lenses by spans of asymmetric ones. This is joint work with Michael Johnson.

Lucius Schoenbaum, Louisiana State University: *A generalization of Topos theory*
In this talk I would like to report on progress on a generalization of topos theory to a model of higher category theory. I will briefy survey the foundations of the (generalized) category theory formalism and present two versions of the development as it can be extended to topos theory. I will discuss their pros and cons, and outlook for the project. Among highlights will be a new and interesting generalization of the Yoneda lemma, Lawvere's comma category (and the closely related category of elements, or the Grothendieck construction), and Giraud's theorem. Time permitting I will discuss for comparison Street's extension of the Giraud theorem to 2-toposes and bitoposes.

Laura Scull, Fort Lewis College: *The Orbifold Construction*
I will discuss general construction of orbifold objects. This is a generalization of the manifold construction described by Grandis. It gives a categorical way to realize the idea of gluings with symmetries and can be applied to any join restriction category. It incorporates the classical definition of orbifolds, but places them in a more general context. This is joint work with R. Cockett and D. Pronk.

Alanod Sibih, Dalhousie University: *A new notion of equivalences for Orbifold atlases*
Last year, I introduced a new notion of orbifold atlas which can be used to describe noneffective orbifolds. This definition uses the language of double categories, and in particular the double category Bimod of finite groups with group homomorphisms as vertical morphisms and bimodules as horizontal morphisms. To describe an atlas, we first consider the underlying sets of the charts in X. These induce a poset category I. To describe the atlas embeddings, we use two pseudo functors, Abst, Con : HI $\longrightarrow$ Bimod and a vertical transformation ρ : Abst $\Rightarrow$ Con. Traditionally, some people have required I to be a full subcategory of O(X), i.e., we give a chart embedding whenever a chart is a subchart of the other. Others have not, and it was shown for Satake's atlases that if the charts are simply connected, the missing embeddings are uniquely induced by the others. This requires a covering space argument. We will show that this is still true for our new atlases, but now this requires extending the pseudo functors and the structure isomorphisms in a coherent way. As an application we will define refinement for orbifold atlases using the notion of so called coloured bimodules over Bimod and derive a new notion of equivalence for orbifold atlases.

Priyaa V. Srinivasan, University of Calgary: *Structure of quantum information resource theories*
This talk is a summary of the work in mathematical physics towards formalizing the notion of resource in quantum information theory. Scientists working in quantum mechanics are searching for ways to harness quantum effects to do useful

tasks. With every task is associated a collection of resources. Hence, the problem of identifying useful tasks is linked to identifying resources provided by quantum theory. The setting that has been adopted for studying resources is a system of free operations that obey certain restrictions: a resource allows the restrictions of the system to be overcome. Resources such as entanglement, coherence, athermality etc., have been studied and developed as resource theories.
Recently, there has been interest in providing a mathematically rigorous notion of resources and defining the general structure of resource theories. In this talk I will present Bob Coecke's work on describing resource theories as symmetric monoidal categories and deriving resource theories from partitioned process theories. I will also present examples.

Jamie Vicary, Oxford:

An introduction to Globular

This tutorial will introduce Globular, a new online proof assistant for calculations in higher category theory, with a fully graphical user interface. We will demonstrate practical use of the tool, as well as investigate the theoretical foundations, including semistrict n-categories and rewriting. No previous knowledge of these topics will be assumed.

Coherence for Frobenius pseudomonoids and 3d proof nets

Frobenius pseudomonoids are higher-dimensional algebraic structures which are known to underlie models of multiplicative linear logic (MLL). We prove a new coherence theorem for these structures, and show how this gives rise to a 3d version of proof nets, and new methods for determining proof equivalence in MLL.

On-Campus Dining
at the University of British Columbia

Student Union Building (1)

Subway Mon – Fri 7:30am-2pm

Starbucks Mon – Fri 7:30am-6pm, Sat 8:30am-3pm

University Village (2)

University Village has many take out and dine in options; diner-style breakfasts, coffee shops, pizza by the slice, bubble tea, a full-service sushi restaurant, a small grocer selling fresh produce and assorted goods, as well as an international food court

Blenz Coffee	Booster Juice	Mio Japan	Granville Island Produce
McDonalds	Pearl Fever Tea House	FreshSlice Pizza	One More Sushi
Only U Café	Starbucks	Pita Pit	Vera's Burger Shack
Subway	Red Burrito	Well Tea	5 Tastes Chinese Bistro
Suga Sushi Japanese	Oven Fresh Bakery	A&W	International Food Court

Wesbrook Village (3)

Wesbrook Village, located on south campus, offers shops, services and homes within a quaint, pedestrian-friendly setting, with access to Pacific Spirit Park and all the amenities of the UBC campus.

Save-On-Foods
Large grocery store with a deli and small café

Chef Hung Taiwanese Beef Noodle
Noodles, soups, rice dishes, and sides

Jugo Juice
Fresh fruit smoothies

BierCraft
Craft pub with a French-inspired Bistro menu.

Menchie's Frozen Yogurt
Frozen yogurt and sorbet bar

Togo Sushi
Fresh sushi made to order

Blenz
Coffee shop

Doughgirls Comfort Kitchen + Bakeshop
Fresh made bread and pastries.

m.ubc.ca

UBC Campus Food Trucks

Hungry Nomad
The original UBC food truck!

Roaming Bowl
Fresh made Asian noodle and rice bowls

The Dog House
The home of the West Coast hot dog

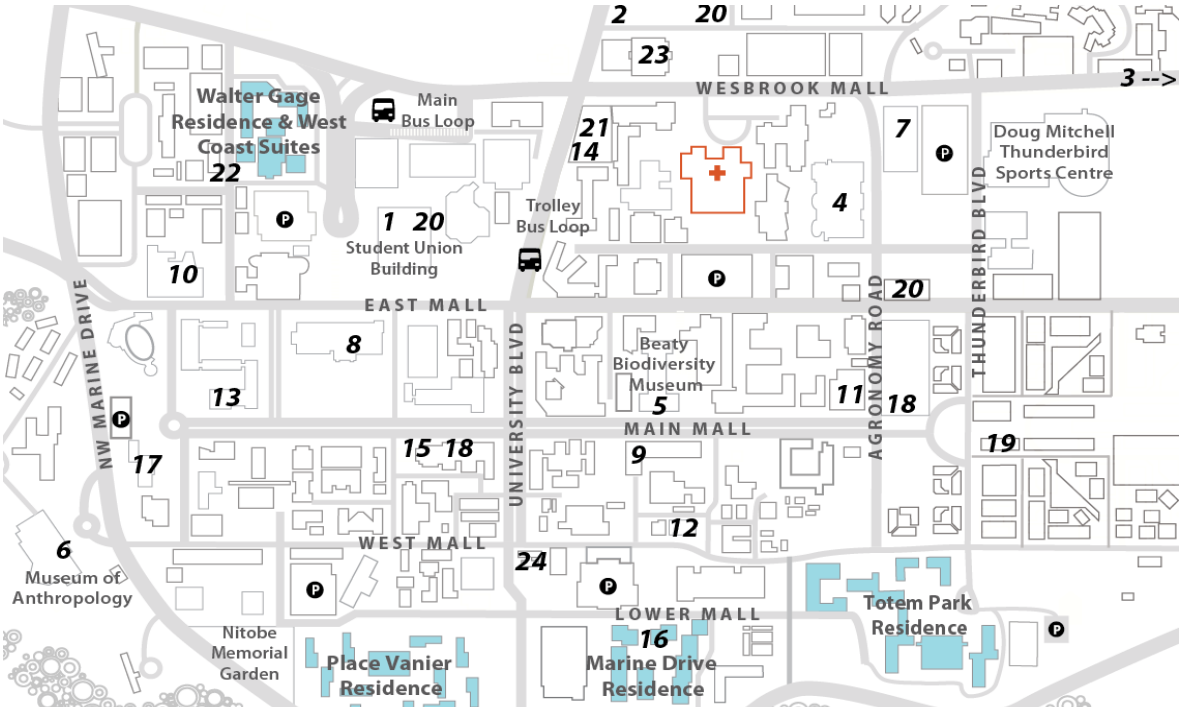
The Nest

The Nest, located on the new University Square beside the Student Union Building, will offer AMS owned and operated restaurants and shops for the summer of 2015!

Perch
Uppercase
Pier^2 Pizza
Flip Side
Qoola Frozen Yogurt Bar
Peko Sushi
Palate
The Pit
Grand Noodle Emporium
The Delly

On-Campus Dining

at the University of British Columbia



Full-Service Restaurants

Mahoney & Sons Public House (14)
Irish-style pub serving salads, appetizers, pizzas, and a sampling of classic pub fare

The Point Grill (16)
Burgers and sandwiches, salads, local seafood, and an outdoor patio to enjoy the sun

Triple O's (15)
Dine in or take out - breakfast sandwiches, beef, chicken, and veggie burgers, and milkshakes

Sage (17)
Healthy, modern West Coast cuisine paired with breathtaking views.

Mercante (24)
Authentic Cucina Italiana, stone oven Italian pizza, salads, pasta, soups and desserts

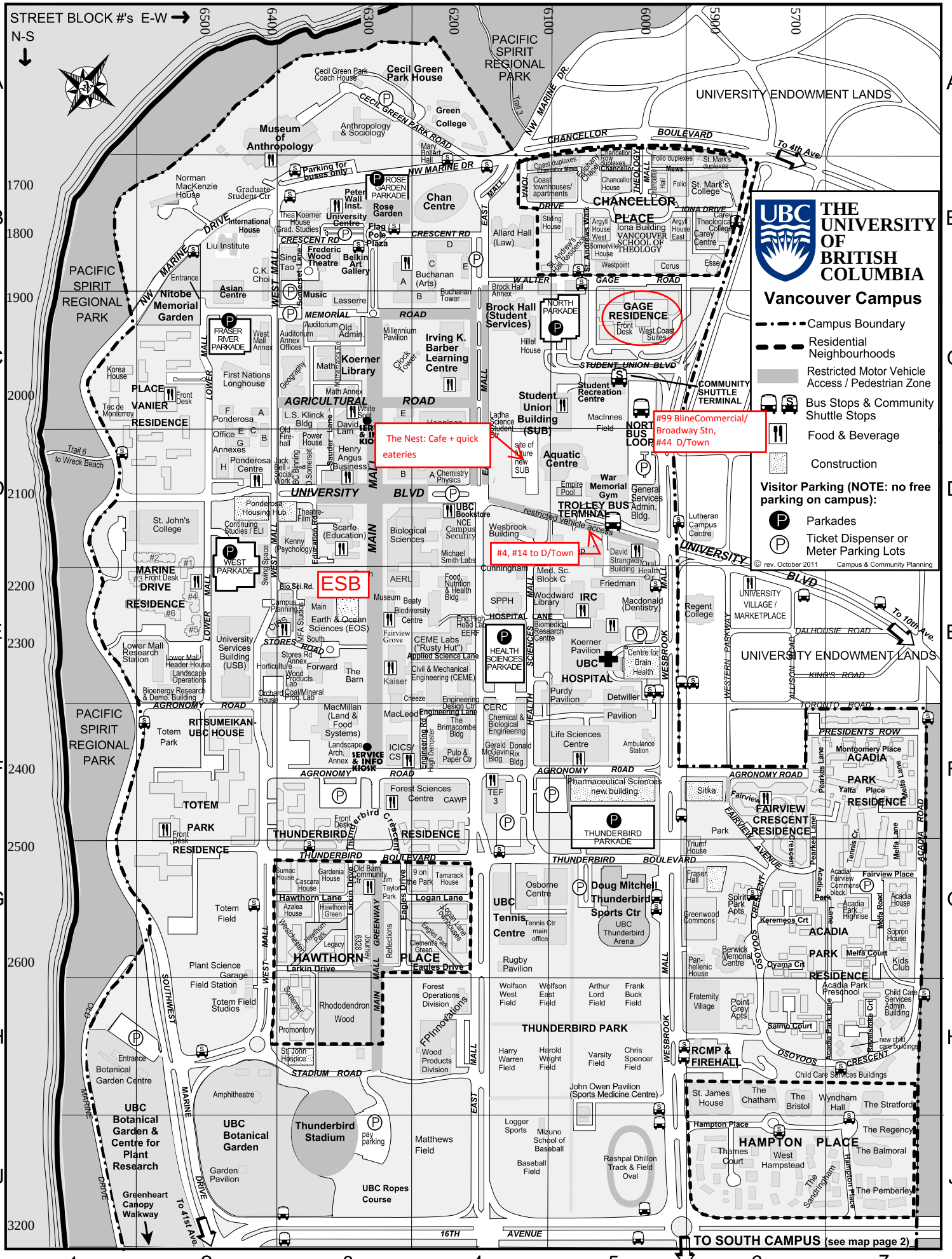
Coffee Shops

Tim Hortons (18)
Bean Around the World (19)
Starbucks (20)
The Boulevard Coffee Roasting Co (21)
Great Dane Coffee (22)
The Well Café (23)

Quick-Service Cafés

These cafés, located in convenient spots across campus, offer a range of snacks and lunch items, including soups, sandwiches, salads, and a variety of hot dishes

Caffe Perugia (4)
Niche Café (5)
Café MOA (6)
Pharmacy Café (7)
Ike's Café (8)
Magma Café (9)
Law Café (10)
Reboot Café (11)
The Loop Café (12)
Stir It Up Café (13)


STREET BLOCK #'s E-W
N-S
THE UNIVERSITY OF BRITISH COLUMBIA
Vancouver Campus
Campus Boundary
Residential Neighbourhoods
Restricted Motor Vehicle Access / Pedestrian Zone
Bus Stops & Community Shuttle Stops
Food & Beverage
Construction
Visitor Parking (NOTE: no free parking on campus):
Parkades
Ticket Dispenser or Meter Parking Lots
© rev. October 2011 Campus & Community Planning
The Nest: Cafe + quick eateries
#99 BlineCommercial/ Broadway Stn, #44 D/Town
#4, #14 to D/Town
ESB
UNIVERSITY ENDOWMENT LANDS
PACIFIC SPIRIT REGIONAL PARK
CHANCELLOR BOULEVARD
NW MARINE DR
UNIVERSITY BLVD
AGRONOMY ROAD
STUDENT UNION BLVD
CRESCENT RD
CECIL GREEN PARK ROAD
THUNDERBIRD BOULEVARD
STADIUM ROAD
16TH AVENUE
TO SOUTH CAMPUS (see map page 2)

Map Directory

Site or Building Name & Address	Grid
Abdul Ladha Science Student Ctr, 2055 East Mall	D4
Acadia/Fairview Commonsblock, 2707 Tennis Cres	G7
Acadia House, 2700-2720 Acadia Rd	G7
Acadia Park Residence	F/H-6/7
Acadia Park Highrise, 2725 Melfa Rd	G7
Acadia Park Preschool, 2750 Acadia Park Lane	H7
Allard Hall [Faculty of Law], 1822 East Mall	B4
Anthropology & Sociology Bldg, 6303 NW Marine Dr	A3
Aquatic Centre, 6121 University Blvd	D5
Aquatic Ecosystems Research Lab (AERL), 2202 Main Mall	E3
Asian Centre, 1871 West Mall	B2
Auditorium (a.k.a. "Old Auditorium"), 6344 Memorial Rd	C3
Auditorium Annex Offices, 1924 West Mall	C3
Barn (daycare), 2323 Main Mall	E3
B.C. Binning Studios (formerly Hut M-17), 6373 University Blvd	D3
Beaty Biodiversity Centre & Museum, 2212 Main Mall	E3/4
Belkin (Morris & Helen) Art Gallery, 1825 Main Mall	B3
Berwick Memorial Centre, 2765 Osoyoos Cres	G6
Bioenergy Research & Demonstration Bldg., 2337 Lower Mall	E2
Biological Sciences Bldg [Science Faculty office], 6270 University Blvd	D3
Biomedical Research Ctr, 2222 Health Sciences Mall	E4
Biotechnology Laboratory, 2125 East Mall	D4
Bollert (Mary) Hall, 6253 NW Marine Dr	A4
Bookstore, 6200 University Blvd	D4
Botanical Garden Centre/Gatehouse, 6804 SW Marine Dr	H1
Botanical Garden Pavilion (enter at Gatehouse, 6804 SW Marine Dr)	J2
Botan. Gard. Greenhses/ Workshops, 6088 S. Campus Rd	South Campus
Brimacombe Building, 2355 East Mall	F4
BROCK HALL: Student Services & Welcome Centre, 1874 East Mall	**C4**
Brock Hall Annex, 1874 East Mall	C4
Buchanan Building (Blocks A, B, C, D, & E) [Arts], 1866 Main Mall	B3/4
Buchanan Tower, 1873 East Mall	C4
C.K. Choi Building for the Institute of Asian Research, 1855 West Mall	B2
Campus & Community Planning, 2210 West Mall	E3
Campus Security, 2133 East Mall	D4
Carey Centre, 5920 Iona Drive	B6
Carey Theological College, 1815 Wesbrook Mall	B6
CAWP (Centre for Advanced Wood Processing), 2424 Main Mall	F4
Cecil Green Park Coach House, 6323 Cecil Green Park Rd	A3
Cecil Green Park House, 6251 Cecil Green Park Rd	A3
CEME — *see Civil & Mechanical Engineering Building*	
Centre for Comparative Medicine, 4145 Wesbrook Mall	South Campus
Centre for Interactive Research on Sustainability (CIRS), 2260 West Mall	E3
CERC (Clean Energy Research Ctr), 2360 East Mall	F4
Chan Centre for the Performing Arts, 6265 Crescent Rd	B4
Chancellor Place neighbourhood	B5
Chemical & Biological Engineering Bldg, 2360 East Mall	F4
Chemistry A Block - Chemistry Physics Building, 6221 University Blvd	D4
Chemistry B,C,D & E Blocks, 2036 Main Mall	D3
Child Care Services Administration Bldg, 2881 Acadia Rd	H7
Child Care Services Bldgs, Osoyoos Cresc and Revelstoke Crt	H7
CIRS — *see Centre for Interactive Research on Sustainability...*	
Civil & Mechanical Engineering Bldg (CEME), 6250 Applied Science Lane	E4
Civil & Mechanical Eng. Labs ("Rusty Hut"), 2275 East Mall	E4
Coal & Mineral Processing Lab, 2332 West Mall	E3
Continuing Studies Bldg [English Language Institute], 2121 West Mall	D2
Copp (D.H.) Building, 2146 Health Sciences Mall	D5
Cunningham (George) Building [Pharmaceutical Sc.], 2146 East Mall	E4
David Lam Learning Centre, 6326 Agricultural Rd	C3
David Lam Management Research Ctr, 2033 Main Mall	C3
Donald Rix Building, 2389 Health Sciences Mall	F4
Doug Mitchell Thunderbird Sports Centre, 6066 Thunderbird Blvd	G5
Dorothy Somerset Studios (formerly Hut M-18), 6361 University Blvd	D3
Earth Sciences Building (ESB) under construction, 2207 Main Mall	E3
Earth & Ocean Sciences (EOS) - Main and South, 6339 Stores Rd	E3
Earthquake Engineering Research Facility (EERF), 2235 East Mall	E4
Engineering High Head Room Lab, 2225 East Mall	E4
English Language Institute (E.L.I.) — *see Continuing Studies Building*	
Environmental Services Facility, 6025 Nurseries Rd	South Campus
Fairview Crescent Residence, 2600-2804 Fairview Cres	F6
Fire Department, 2992 Wesbrook Mall	H6
First Nations Longhouse, 1985 West Mall	C2
Flag Pole Plaza (Main Mall & Crescent Rd)	B3
Food, Nutrition and Health Bldg, 2205 East Mall	E4
Forest Sciences Centre [Faculty of Forestry], 2424 Main Mall	F4
Forward (Frank) Building, 6350 Stores Rd	E3
FPInnovations (Forest Operations & Wood Products), 2601/2665 E. Mall	H4
FPInnovations (Pulp & Paper Division), 3800 Wesbrook Mall	South Campus
Fraser Hall (public rental housing), 2550 Wesbrook Mall	G6
Fraternity Village, 2880 Wesbrook Mall	H6
Frederic Wood Theatre, 6354 Crescent Rd	B3
Friedman Bldg, 2177 Wesbrook Mall	E5
Gage Residence, 5959 Student Union Blvd	C5
General Services Administration Bldg (GSAB), 2075 Wesbrook Mall	D5
Geography Building, 1984 West Mall	C3
Gerald McGavin Building, 2386 East Mall	F4
Graduate Student Centre — *see Thea Koerner House*	
Green College, 6201 Cecil Green Park Rd	A4
Greenheart Canopy Walkway, Botanical Garden, 6804 SW Marine Dr	H1
Greenwood Commons (public rental housing), 2660 Wesbrook Mall	G6
Hampton Place neighbourhood	H/J-6/7
Hawthorn Place neighbourhood	G/H3
Hebb Building, 2045 East Mall	D4
Hennings Building, 6224 Agricultural Rd	C4
Henry Angus Building [Sauder School of Business], 2053 Main Mall	D3
Hillel House - The Diamond Foundation Centre for Jewish Campus Life, 6145 Student Union Blvd	C4
Horticulture Building/Greenhouse, 6394 Stores Rd	E2/3
Hugh Dempster Pavilion, 6245 Agronomy Rd	F4
ICICS/CS (Institute for Computing, Information & Cognitive Systems/Computer Science), 2366 Main Mall	F4
Instructional Resources Centre (IRC), 2194 Health Sciences Mall	E5
International House, 1783 West Mall	B2
In-Vessel Composting Facility, 6035 Nurseries Road	South Campus
Irving K. Barber Learning Centre, 1961 East Mall	C4
Jack Bell Building for the School of Social Work, 2080 West Mall	D3
John Owen Pavilion & Allan McGavin Sports Medicine Centre, 3055 Wesbrook Mall	H5
Kaiser (Fred) Building [Faculty of Applied Science], 2332 Main Mall	E3
Kenny (Douglas T) Building, 2136 West Mall	D3
Kids Club, 2855 Acadia Rd	G7
Klinck (Leonard S.) Bldg, 6356 Agricultural Rd	C3
Koerner (Walter C.) Library, 1958 Main Mall	C3
Landscape Architecture Annex, 2371 Main Mall	F3
Lasserre (Frederic) Building, 6333 Memorial Rd	C3
Law, Faculty of — *see Allard Hall*	
Leon and Thea Koerner University Centre, 6331 Crescent Rd	B3
Life Sciences Centre, 2350 Health Sciences Mall	F5
Liu Institute for Global Issues, 6476 NW Marine Dr	B2
Lower Mall Header House, 2269 Lower Mall	E2
Lower Mall Research Station, 2259 Lower Mall	E2
Macdonald (J.B.) Building [Dentistry], 2199 Wesbrook Mall	E5
MacLeod (Hector) Building, 2356 Main Mall	F3
MacMillan (H.R.) Bldg [Faculty of Land & Food Systems], 2357 Main Mall	F3
Marine Drive Residence (Front Desk in Bldg #3), 2205 Lower Mall	E2
Material Recovery Facility, 6055 Nurseries Rd	South Campus
Mathematics Annex, 1986 Mathematics Rd	C3
Mathematics Building, 1984 Mathematics Rd	C3
Medical Sciences Block C, 2176 Health Sc. Mall	E4
M.F.A. Studios (formerly B.C. Binning MFA Studios), 6363 Stores Rd	E3
Michael Smith Laboratories, 2185 East Mall	D4
Museum of Anthropology (MOA), 6393 NW Marine Dr	A2/3
Music Building, 6361 Memorial Rd	B/C3
Networks of Ctrs of Excellence (NCE), 2125 East Mall	D4
Nitobe Memorial Garden, 1895 Lower Mall	B/C2
Nobel Biocare Oral Heath Centre (David Strangway Bldg), 2151 Wesbrook Mall	E5
Norman MacKenzie House, 6565 NW Marine Dr	B2
NRC Institute for Fuel Cell Innovation, 4250 Wesbrook Mall	South Campus
Old Administration Building, 6328 Memorial Rd	C3
Old Auditorium — *see Auditorium*	
Old Barn Community Centre, 6308 Thunderbird Blvd	G3
Old Firehall, 2038 West Mall	D3
Orchard House, 2336 West Mall	E2
Osborne (Robert F.) Centre/Gym, 6108 Thunderbird Blvd	G4
Panhellenic House, 2770 Wesbrook Mall	G6
Peter Wall Institute for Advanced Studies, 6331 Crescent Rd	B3
Place Vanier Residence, 1935 Lower Mall	C/D2
Plant Ops Nursery/Greenhouses, 6029 Nurseries Rd	South Campus
Plant Science Field Station & Garage, 2613 West Mall	H2
Point Grey Apartments, 2875 Osoyoos Cresc	H6
Police (RCMP) & Fire Department, 2990/2992 Wesbrook Mall	H6
Ponderosa Centre, 2071 West Mall	D2
Ponderosa Office Annexes: A, B, & C, 2011-2029 West Mall	C/D2
Ponderosa Office Annexes: E to H, 2008-2074 Lower Mall	C/D2
Power House, 2040 West Mall	D3
Pulp and Paper Centre, 2385 East Mall	F4
Ritsumeikan-UBC House, 6460 Agronomy Rd	F2
Rose Garden	B3
Roy Barnett Recital Hall - in Music Building	
Rugby Pavilion, 2584 East Mall	G4
Scarfe (Neville) Building [Education], 2125 Main Mall	D3
School of Population & Public Health (SPPH), 2206 East Mall	E4
Simon K.Y. Lee HKU-UBC House — Bldg #1, Marine Drive Residence	E2
Sing Tao Building, 6388 Crescent Rd	B3
Sopron House, 2730 Acadia Rd	G7
South Campus Warehouse, 6116 Nurseries Rd	South Campus
Spirit Park Apartments, 2705-2725 Osoyoos Cresc	G8
St. Andrew's Hall/Residence, 6040 Iona Dr	B5
St. John's College, 2111 Lower Mall	D2
St. Mark's College, 5935 Iona Dr	B6
Staging Research Centre, 6045 Nurseries Rd	South Campus
Stores Road Annex, 6368 Stores Rd	E3
Student Recreation Ctr, 6000 Student Union Blvd	C5
Student Union Bldg (SUB), 6138 Student Union Blvd	C4
TEF3 (Technology Enterprise Facility 3), 6190 Agronomy Rd	F4
Thea Koerner House [Faculty of Graduate Studies], 6371 Crescent Rd	B3
Theatre-Film Production Bldg, 6358 University Blvd	D3
Thunderbird Residence, 6335 Thunderbird Cresc	F3/4
Thunderbird Stadium, 6288 Stadium Rd	J3
Thunderbird Winter Sports Ctr — *see Doug Mitchell Thunderbird Sports...*	
Totem Field Studios, 2613 West Mall	H2
Totem Park Residence, 2525 West Mall	F/G2
TRIUMF, 4004 Wesbrook Mall	South Campus
Triumf House (TRIUMF Visitor's Residence), 5835 Thunderbird Blvd	G6
UBC Bookstore, 6200 University Blvd	D4
UBC Farm, 6182 Wesbrook Mall	South Campus
UBC Hospital, 2211 Wesbrook Mall	E5
UBC Tennis Centre, 6160 Thunderbird Blvd	G4
UBC Thunderbird Arena (in Doug Mitchell Centre), 2555 Wesbrook Mall	G5
University Centre (Leon & Thea Koerner), 6331 Crescent Rd	B3
University Neighbourhoods Association, 5923 Berton Ave	South Campus
University Services Building (USB), 2329 West Mall	E2
Vancouver School of Theology, 6000 Iona Drive	B5
Walter H. Gage Residence, 5959 Student Union Blvd	C5
War Memorial Gymnasium, 6081 University Blvd	D5
Wayne & William White Engineering Design Ctr, 2345 East Mall	E4
Wesbrook Bldg, 6174 University Blvd	D4
Wesbrook Place neighbourhood	South Campus
Wesbrook Village shopping centre	South Campus
West Mall Annex, 1933 West Mall	C2
West Mall Swing Space Bldg, 2175 West Mall	D2
Wood Products Laboratory, 2324 West Mall	E3
Woodward IRC, 2194 Health Sciences Mall	E4/5
Woodward Library, 2198 Health Sciences Mall	E4/5

SOUTH CAMPUS MAP

Campus & Community Planning
www.planning.ubc.ca

Note:
Local traffic only along Wesbrook Mall on South Campus

Map Information

Need help finding your way on campus? Call the Campus & Community Planning MapInfo Line at 604-827-5040, M-F, 8:30-4:30

Or use the online searchable colour map at www.maps.ubc.ca