

ATSC Undergrad Advising - Degree Requirements

<https://vancouver.calendar.ubc.ca/faculties-colleges-and-schools/faculty-science/bachelor-science/atmospheric-science>

Honours in ATSC (0429)

valid summer 2023

Differences from ATSC majors is highlighted in green.

First Year Courses	Credits	Prerequisites & Footnotes
Communication Requirement ¹	6	Footnote 1. For a full list of acceptable courses see Communication Requirement. https://vancouver.calendar.ubc.ca/node/15384
DSCI 100 -Intro to Data Sci.(R or python)	3	
CHEM 121-Structure & bonding (or CHEM 111 - Struct, bonds, equilib. or CHEM 141 - Bonds, struct. for labs) & take the associated lab.	4	Footnote: 2. Students who do not have B.C. High School Chemistry 12 (or its equivalent) must write the UBC Chemistry Basic Skills Test and may be required to take CHEM 100 (Foundations of chem). CHEM 110 lecture + CHEM 115 lab may substitute for CHEM 111, CHEM 120 lecture + CHEM 115 lab may substitute for CHEM 121,
CHEM 123-Thermo, kinetics, organic. & take associated lab.	4	1 Prereq: Chem 121, 111, or 141. Footnote 2. CHEM 130 lecture a+nd CHEM 135 lab may substitute for CHEM 123.
MATH 100 -Differential Calc. w Applic. (or MATH 102 - Diff.Calc. for Life Sci., or MATH 104 - Diff.Calc. for SocialSci.)	3	Footnote 3. MATH 180 or MATH 184 or MATH 120 Honours Diff. Calc. may substitute for any of the specified differential calculus courses listed by decreasing the electives by 1 credit. MATH 110 Diff.Calc (& algebra, geom, trig., logs., exponentials, 6 cr) may substitute for any of the specified differential calculus courses listed by decreasing the electives by 3 credits.
MATH 101 -Integral Calculus (or MATH 103 - Integral .calc. for LifeSci, or MATH 105 - Integral calc. for Social.)	3	1 Prereq: Differential Calc. Footnote 4. MATH 121 Honours Integral Calc. may substitute for any of the specified integral calculus courses listed by decreasing the electives by 1 credit.
PHYS 106 or PHYS 107 or PHYS 117 - Dynamics & waves (or 101 or 131)	3	Footnote 5: Students without Physics 12 must take PHYS 100 prior to other physics courses. PHYS 100 will be counted as an elective. {Honours} students are encouraged to take PHYS 106 (Enriched Phys1).
PHYS 108 (or 118) -Elect., Light, Radiation	3	1 Prereq: PHYS Dynamics & waves, or equiv. Footnote 5: {Honours} students are encouraged to take PHYS 108 (Enriched Phys2).
PHYS 119 (or 109) - Lab	1	
Elective	3	Footnote 6: Students are permitted to move elective credits between years. Footnote 7: Elective credits together with required courses must fulfill the Faculty of Science's: a) Foundational Requirement; (1 course each in biol, phys, chem, UNLESS already had in high school) b) Laboratory Science Requirement; (take 1 lab course - see specified list) c) Science Breadth Requirement; (take 3 cr from any 6 topics: math, chem, phys, life sci, stat, cpssc, earth) d) Science and Arts Requirements; (72 cr in Sci, & 12 cr in Arts). Note: GEOS/GEOB is sci. e) Upper-level Requirement; (48 cr of courses ≥300, of which 30 cr must be science) f) General Degree Requirements (120 cr total, etc.).
Total Credits	33	

Second Year Courses

	Credits	Prerequisites & Footnotes
ATSC 201-Meteorology of Storms	3	Prereq for ATSC 201- completion of 1st year science (recommended, but not required)
CHEM 205 -Physical Chem.	3	2 Prereqs: one of MATH 100, MATH 102, MATH 104 ... and one of CHEM 123 ...
EOSC 211-Computer Methods (or CPSC 103 -Program Design Intro, or CPSC 110 -Programming (4 cr))	3	1 Prereq for EOSC 211 - integral calculus Footnote 8: If choosing CPSC 110, reduce electives by 1 credit.
MATH 221 - Matrix Algebra	3	1 Prereq: first-year integral calculus
MATH 217 - Multivariate & Vector Calc.	4	3 Prereqs: (high grade (≥68%) in one of PHYS 108, 118...) + (high grade in First-yr integral calc.) + corequisite: (One of MATH 152, MATH 221, MATH 223)
MATH 215 - Elem. Differential Eqs.1	3	3 Prereqs: First-yr integral calc. + (one of MATH 152, MATH 221, MATH 223) + corequisite: MATH 217 ...
PHYS 203 -Thermal Physics 1	4	2 Prereqs: (One of PHYS 108, 118, ...) + Corequisite (one of MATH 217 ...)
PHYS 216 - Interm. Mechanics (Newtons Laws)	3	3 Prereqs: (One of PHYS 106, PHYS 107, PHYS 117, ...) + (One of MATH 221, ...) + Corequisite (one of MATH 217, ...)
STAT 201 - Stat.Inference for Data Sci. (or STAT 200 -Mean, var, anova, or STAT 251 -Prob., regression, hypo.test)	3	1 Prereq for STAT 201: DSCI 100 1 Prereq for STAT 200 & 251: Integral calc. Footnote 9: STAT 201 is recommended for students who wish to pursue a minor in data science. STAT 200 or 251 (plus STAT 302-Probability) are recommended for students interested in taking further courses in statistics.
Electives	4	Footnote7: Same as year-1 Elective footnotes. Footnote8: If choosing CPSC 110, reduce electives by 1 credit. Recommendation: Some 3rd & 4th Year courses listed below show a "CAUTION" prerequisite. Namely, a course that is NOT already listed above. So you could plan your electives here in Year 2 to satisfy the prereqs of courses that you want to take in the next couple years.
Total Credits	33	

<u>Third & Fourth Year Courses</u>	Credits	Prerequisites & Footnotes
ATSC 301-Atm.Radiation & Remote Sens.	3	2 Prereqs: (PHYS 108 or 118) + (familiarity with a programming language) Footnote 10: Usually only offered every other year. Check timing with the advisor and plan accordingly.
ATSC 303 -Weather Instruments	3	2 Prereqs: a computer programming course, and either ATSC 201 or GEOS 200. Footnote 10: Usually only offered every other year. Check timing with the advisor and plan accordingly.
ATSC 404 -Dynamic Met.	3	2 Prereqs: One of EOSC 352 Continuum Dyn (CAUTION need additional course EOSC 250 Fields and Fluxes or MATH 317 div grad curl) , MATH 316 Diff.Eq.2, or PHYS 312 Math.Phys.partial Diff.Eq. & One of EOSC 250 Fields & Fluxes, MATH 217 multivar.vector calc., MATH 317 div grad curl
ATSC 405 -Cloud Phys & Chem.	3	3 Prereqs: MATH 215 & familiarity with programming & corequisite(PHYS 203 or CHEM 304 Thermo)
ATSC 413 -Forest-fire weather & clim.	3	1 Prereq: ATSC 201 or GEOS 200
ATSC 449 -Honours Project	6	Needs approval from ATSC chair
CHEM 302 -Amos. Chem.	3	Prereqs: CHEM 123 and 3rd year standing
ENVR 300 -Research in Environ.Sci.	3	Prereq: 3rd year science standing or higher
GEOS (or GEOB) 300 - Microscale, turb.	3	Prereq: (one of ATSC 201, GEOS/GEOB 200, ...)
MATH 300 -Complex Variables	3	2 Prereqs: One of (MATH 200, 217, 226, 253, 254) & coreq. one of (MATH 217 ...)
MATH 301 -Applied Analysis	3	3 Prereqs: One of (MATH 300...) & one of (MATH 215...) & coreq. one of (MATH 316...).
MATH 316 - Diff.Eq.2	3	1 Prereq: One of (MATH 215 ...)
MATH 400 - Applied Partial Diff.Eq.	3	2 Prereqs: One of (MATH 300...) & one of (MATH 316...)
One of:	3	
PHYS 301 -Elect. & Magnetism		2 Prereqs: One of (PHYS 108, 118, ...) & One of (MATH 217 ...)
PHYS 354 -Elect. & Magnet. Fields		3 Prereqs: One of (PHYS 108 ...) & One of (MATH 215 ...) & One of (MATH 217 ...)
PHYS 314 -Fluids	3	2 Prereqs: MATH 215 & Coreq. PHYS 203.
ATSC Electives	6	Footnote 11: Selected from ATSC 313, 409; EOSC 340, 352, 354, 372, 410; GEOS (or GEOB) 400, 401, 402. Recommendation: Some 3rd & 4th Year courses listed above show a "CAUTION" prerequisite. Namely, a course that is NOT already listed above. So you could plan your electives here to satisfy the prereqs of the other 3rd and 4th year courses that you want to take.
Other Electives	12	Footnote 7 (same as Year 1)
Total Credits in 3rd + 4th Years	66	

TOTAL CREDITS TO GRADUATE 132 with a honours in Atmospheric Science.

Note: The ATSC honours program above was designed to satisfy meteorologist qualifications for **Environment & Climate Change Canada (ECCC)** as well is giving a solid foundation for entry into **grad school**.

ECCC has stated that the UBC courses shown in **BLUE** will satisfy ECCC's education requirements to be hired as a meteorologist.

Dynamic Meteorology course	ATSC 404 - Dynamic Meteorology (Prerequisite: One of EOSC 352, MATH 316, PHYS 312 and one of EOSC 250, MATH 217, MATH 317.)
Thermodynamic Meteorology course	ATSC 405 - Cloud Physics & Chem. (Prerequisite: MATH 215. Familiarity with a programming language is required. Corequisite: One of PHYS 203, CHEM 304.)
Synoptic Meteorology course	ATSC 413 - Forest-fire Weather & Climate
Three other Meteorology courses	Satisfied by the existing ATSC major.
30 credits or more in Physics & Math	This would be satisfied with the courses required for the ATSC honours.

Note: ECCC does NOT require any specific grade in the courses listed above.