Bachelor of Science – General (Computational Science Concentration)

Program: BSCSCI GSCI | Intake: September 2022 -

Student ID Number / Name:	

This guide is for program planning purposes only. Students are responsible for checking the Capilano University Calendar & meeting program requirements. Students are strongly encouraged to check the pre-requisite of courses in advance.

- **Note**: Students may need to take one or more of CHEM 101, MATH 105, PHYS 104 before enrolling into CHEM 110; MATH 108/116; PHYS 112/113/114.

Program Requirements			
Course	**Course Title**	**Course Credits**	**Grades**
ENGL 100	University Writing Strategies	3.00	
	Select one of the options from the following list: o CMNS 250: Introduction to Technical Writing o English at 100-level or higher	3.00	
	6 credits of Humanities or Social Science at 100-level or higher [Note: May not include courses used to satisfy the English Requirement.]	3.00	
		3.00	
INTS 110	Making Change: Regional Research and Action	3.00	
COMP 115	Learn to Code *[Note: One of Pre-calculus 11 or Foundations of Mathematics 11 or Workplace Mathematics 11 or Computer Science 11 or BMTH 044 or BMTH 048 or Math Placement Test (Precalculus MPT) or COMP 101 (B-).]*	4.00	
	Select one of the options from the following list: o MATH 108: Calculus I for Business, Social Sciences and Life Sciences (3.00) *[Note: Math Placement Test (MPT); or Pre-calculus 12 with a minimum B grade; or MATH 105 with a minimum C- grade; or BMTH 054 with a minimum C+ grade.]* [Note: MATH 108 is equivalent to MATH 116. Duplicate credit will not be granted for this course and MATH 116.] o MATH 116: Calculus I - The Mathematics of Change (4.00) *[Note: Math Placement Test (MPT); or Pre-calculus 12 with a minimum A grade; or Pre-calculus 12 and Calculus 12 with a minimum B grade in each; or MATH 105 with a minimum C- grade; or BMTH 054 with a minimum B grade.]* [Note: MATH 116 is equivalent to MATH 108. Duplicate credit will not be granted for this course and MATH 108.]	3.00	
	Select one of the options from the following list: o MATH 109: Calculus II for Business, Social Sciences and Life Sciences (3.00) *[Note: MATH 108 or 116 with a minimum C- grade.]* o MATH 126: Calculus II (3.00) *[Note: MATH 116 with a minimum C- grade.]*	3.00	
	Select one of the options from the following list: [Note: STAT 101 or STAT 205 is recommended.] o BADM 210: Business Statistics (3.00) o PSYC 213: Statistical Methods in Psychology (3.00) *[Note: PSYC 100 and PSYC 101; and MATH 097 (C) or MATH 123 (C) or MATH 091 (C+) or BMTH 043 (C+) or MATH 096 (C-) or BMTH 044 (C-) or BMTH 048 (C) or Pre-calculus 11 (C) or Principles of Math 11 (C) or Foundations of Math 11 (C) or Applications of Math 11 (C) or Applications of Math 12 (pass).]* o STAT 101: Introduction to Statistics (3.00) *[Note: Math Placement Test (MPT); or MATH 097; or MATH 091 or BMTH 043 with a minimum C+ grade; or MATH 096 or BMTH 044 with a minimum C- grade; or MATH 123 or BMTH 048 or Pre-calculus 11 or Principles of Math 11 or Foundations of Math 11 or Applications of Math 11 with a minimum C grade.]* [Note: STAT 101 is equivalent to MATH 101 and MATH 204. Duplicate credit will not be granted for this course and MATH 101 or MATH 204.] o STAT 205: Introduction to Probability and Statistics (3.00) *[Note: MATH 109 or MATH 126 as a prerequisite or corequisite.]* [Note: STAT 205 is equivalent to MATH 205. Duplicate credit will not be granted for this course and MATH 205.]	3.00	

Course	Course Title	Course Credits	Grades
	Select one of the options from the following list: o BIOL 106: Introductory Biology I (1.50) and o BIOL 107: Introductory Biology II (4.00) [Note: BIOL 106 and BIOL 107 together are equivalent to BIOL 109 and BIOL 110. Duplicate credit will not be granted for BIOL 106/107 and BIOL 109 or BIOL 110.] o BIOL 109: Introductory Biology (5.50) [Note: BIOL 109 is equivalent to BIOL 110 and BIOL 106/107. Duplicate credit will not be granted for this course and BIOL 110 or BIOL 106/107.] o BIOL 110: General Biology I (4.00) *[Note: Chemistry 11 (C+) or CHEM 130 (C+) or BCHM 044 (C+) or Chemistry 12 (C+) or CHEM 101 (C+) or BCHM 054 (C+).]* [Note: BIOL 110 is equivalent to BIOL 106 and BIOL 107 together, and BIOL 109. Duplicate credit will not be granted for this course and BIOL 106/107 or BIOL 109.]	4.00	
CHEM 110	Bonding and Structure *[Note: Chemistry 12 (C+) or CHEM 101 (C+) or BCHM 054 (C+); and Precalculus 12 (C+) or BMTH 054 (C-) or MATH 105 (C-) or Calculus MPT.]*	4.00	
	Select one of the options from the following list: o PHYS 112: Introductory Physics for the Life Sciences I (4.00) *[Note: Physics 12 or BPHY 053/054 or PHYS 104; and Pre-calculus 12 or BMTH 054 or MATH 105.]* [Note: PHYS 112 is equivalent to PHYS 110 and PHYS 114. Duplicate credit will not be granted for this course and PHYS 110 or PHYS 114.] o PHYS 113: Introductory Physics for the Life Sciences II (4.00) *[Note: Physics 12 or BPHY 053/054 or PHYS 104; and Pre-calculus 12 or BMTH 054 or MATH 105.]* [Note: PHYS 113 is equivalent to PHYS 111 and PHYS 115. Duplicate credit will not be granted for this course and PHYS 111 or PHYS 115.] o PHYS 114: Fundamental Physics I (4.00) *[Note: Physics 12 (B) or BPHY 054 (B) or PHYS 104 (C-); and MATH 116 as a pre- or corequisite.]* [Note: PHYS 114 is equivalent to PHYS 110 and PHYS 112. Duplicate credit will not be granted for this course and PHYS 110 or PHYS 112.]	4.00	
COMP 215	Introduction to Computational Science *[Note: COMP 115 (A-); or COMP 115(C+) and one of MATH 116 (C-) or MATH 108 (C-) or MATH 124 (C-).]*	4.00	
MATH 252	Linear Algebra and Differential Equations *[Note: MATH 109 or MATH 126 as a prerequisite or corequisite.]* [Note: MATH 200 could be used here.]	4.00	
	Science at 200-level or higher [Note: Only courses designated as Science from the Faculty of Arts & Sciences.] [Note: Students must choose courses that support their choice of concentration & Upper Level Science electives.]	3.00	
	Science subject areas*: APSC; ASTR; BIOL; CHEM; COMP; GEOG-Physical (GEOG 212, 214, 221, 225, 355, 435); MATH; PHYS; PSYC-Science (PSYC 212, 213, 225); STAT.*	3.00	

Electives Requirement

Course	Course Title	Course Credits	Grades
		4.00	
		4.00	
		3.00	
		3.00	
	32 credits of Electives [Note: At least 12 credits must be outside of Science (100-level or higher).] [Note: At least 15 credits must be 300-level or higher (Science or non-Science).] [Note: Students must choose courses that support their choice of concentration & Upper Level Science electives.]	3.00	
		3.00	
		3.00	
		3.00	
		3.00	
		3.00	

Course	Course Title	Course Credits	Grades
Upper Level Science Requirements			
	15 credits of Science at 300- or 400-level [Note: Only courses designated as Science from the Faculty of Arts & Sciences.] ***Science subject areas***: *ASTR; BIOL; CHEM; COMP; GEOG-Physical (GEOG 355, 435); MATH; PHYS; STAT.*	3.00	
		3.00	
		3.00	
		3.00	
		3.00	
Computational Science Concentration [Note: Each concentration must include at least one Laboratory Science course or a course with a computer lab.]			
	Select one of the options from the following list: o COMP 320: Database Technologies and Applications (4.00) *[Note: 45 credits of 100-level or higher coursework and COMP 215.]* o COMP 330: Data Wrangling: Scripting for Automated Data Processing (4.00) *[Note: 45 credits of 100-level or higher coursework and one of COMP 115 (A-) or COMP 215.]*	4.00	
	Select **three** courses from the approved list of Computational Sciences below: o COMP 301: Computing Technologies in a Digital Culture (3.00) *[Note: 45 credits of 100-level or higher coursework and one of COMP 101 or COMP 115 or MOPA 209.]* o COMP 320: Database Technologies and Applications (4.00) *[Note: 45 credits of 100-level or higher coursework and COMP 215.]* o COMP 330: Data Wrangling: Scripting for Automated Data Processing (4.00) *[Note: 45 credits of 100-level or higher coursework and one of COMP 115 (A-) or COMP 215.]*	3.00	
	o MATH 330: Mathematical Modelling (3.00) *[Note: 45 credits of 100-level or higher coursework including: MATH 109 or MATH 126; and MATH 200 or MATH 252.]* o MATH 336: Applied Graph Theory and Optimization (3.00) *[Note: 45 credits of 100-level or higher coursework including MATH 124.]* o MATH 400: Introduction to Machine Learning (3.00) *[Note: STAT 305; and MATH 108 or MATH 116.]*	3.00	
	o STAT 305: Introduction to Big Data Analysis (3.00) *[Note: COMP 215 and one of STAT 101, STAT 205, LBST 201, BADM 210, PSYC 213, TOUR 350 or KINE 302.]* o STAT 310: Predictive Modelling and Analysis of Experimental Data (3.00) *[Note: 45 credits 100-level or higher coursework including one of STAT 101, STAT 205, LBST 201, BADM 210, PSYC 213, TOUR 350 or KINE 302.]*	3.00	
Experiential Requirement			
SCI 400	Research Project *[Note: 12 credits of 300-level or higher coursework in designated Science courses from the Faculty of Arts and Sciences.]*	3.00	
Capstone Requirement			
CAPS 499	Degree Portfolio *[Note: 90 credits of 100-level or higher coursework including at least one Cap Core Experiential course.]*	3.00	
	Total <u>Degree</u> program credits:	**120.00**	

Comments:

- Students starting this program from September 2022 onwards are able to use this program planner. You may refer to **Capilano University Academic Calendar** for your program profile requirements.

- **Note**: Students must obtain a concentration in Biomedical Science, Computational Science, or Environmental Science by completing 12.00 credits of approved courses for the chosen concentration. Students should ensure they have the appropriate pre-requisites.

- **Note**: Please note that Upper Level courses in the concentrations are offered on a rotating basis factoring in demand for particular courses and will not necessarily be available every year.

- **Quantitative/Analytical Requirement**: A Quantitative/Analytical course is a requirement of all University baccalaureate degrees.

Quantitative/Analytical Elective Course:	☐

- **Residency Requirement**: Students transferring to Capilano University must complete a minimum of 50% of their program course credits at Capilano University, the majority of which will normally fulfill the requirements of their final years of study.

- **Graduation Requirement**: A *minimum* **CGPA of 2.00** (calculated on all program required courses) must be achieved to graduate from all Capilano University credentials. Programs may have additional graduation requirements as approved by the University Senate.
  - Check your cumulative Grade Point Average (cGPA) yourself using the **GPA Calculator** on CapU website.

- **Timeframe for Completion of the program and Graduation**: Students in a four-year program would be given ten years to complete their program.

- **Cap Core Requirement**: Students starting in their baccalaureate degree on or after Fall 2018 and graduating on or after June 2022 must meet Cap Core graduation requirements in addition to their program requirements.

Foundation (6 credits)	
Foundation - **Literacy**	☐ ENGL 100 (3.00)
Foundation - **Numeracy**	☐
Integration (18 credits)	
Integration - **Culture and Creative Expression**	☐
Integration - **Science and Technology**	☐ COMP 115 (4.00)
Integration - **Self and Society**	☐ INTS 110 (3.00)
Integration Elective: o Culture and Creative Expression o **Science and Technology** o Self and Society	☐ CHEM 110 (4.00)
Integration Elective: o Culture and Creative Expression o **Science and Technology** o Self and Society	☐ COMP 215 (4.00)
Integration Elective: o Culture and Creative Expression o Science and Technology o Self and Society	☐
Professional Practice (6 credits)	
Professional Practice - **Capstone**	☐ CAPS 499 (3.00)
Professional Practice - **Experiential**	☐ SCI 400 (3.00)