

Biology Flexible Pre-Major Implementation Project

Final Report

May 26, 2015

**Submitted to BCCAT on behalf of the BCCAT Biology Articulation Committee
Christine Hodgson
May 26, 2015**

Background

Discussion about possible opportunities of a Flexible Pre-Major (FPM) in Biology was initiated at the 2010 Biology Articulation Committee Meeting. The Committee agreed to form a sub-committee to review the opportunity Biology FPM. Frank Williams of Langara College and Betty Mosher of College of the Rockies comprised the sub-committee.

In January of 2011, the sub-committee submitted a letter of intent to BCCAT to conduct an analysis of Biology FPM which was approved. Betty Mosher reported on the progress of the project at the May 2011 Biology Articulation Committee Meeting. At that meeting, a motion to apply for funding to conduct the analysis phase of the Biology FPM was unanimously approved.

At the May 2012 Biology Articulation Committee Meeting, Betty Mosher reported out on the Analysis Project, final report submitted to BCCAT in September of that year.

In the report, Betty Mosher identified three 2nd year Biology courses that are required for all Biology degrees: Cell Biology, Ecology, and Genetics. In some cases, these courses are offered at the 3rd year level instead of 2nd year, but are part of degree requirements nonetheless. Furthermore, Microbiology, Biochemistry, and Vertebrate Biology were identified as courses that were needed for degree completion.

Smaller post-secondary institutions are unable to offer all possible 2nd year courses for students. Therefore, they have one of three options to serve their students:

- 1) Design curriculum to match the curriculum at the greatest number of universities;
- 2) Align curriculum with a single university, the one students from their institution are likely to attend;
- 3) Design curriculum to give students the ability to transfer with a flexible pre-major.

The Biology FPM option is very desirable for smaller institutions but would require cooperation with at least some of the degree-granting institutions. Unlike other disciplines, Biology programming for 1st and 2nd year is not exceedingly diverse and therefore lends itself well to the idea of Biology FPM. In addition, it could easily be bundled with an Associate of Science degree at the smaller institution.

At the May 2013 Biology Articulation Committee Meeting, a motion to proceed with the Implementation Phase of the Biology FPM was unanimously approved. Christine Hodgson agreed to write the application and take on the project. In May 2014, The Biology FPM Implementation Project was approved by BCCAT. In September 2014, Christine Hodgson received a 33% teaching release to lead the implementation process.

Rationale for Creation of the Flexible Pre-Major in Biology

The Committee views the Biology FPM as a mechanism to allow students meet the lower level requirements for a major prior to transfer, typically after the second year of study. The list of courses meet the first and second year Biology major subject area requirements of a number of degree-granting institutions, thus assisting students with program planning and allowing them to keep multiple options open when they transfer into third year.

The Biology FPM is ambitious in that it outlines the requirements for first and second year for not only Biology, but also Physics, Chemistry, and Mathematics. This is possible due to the similarity of degree requirements across the Province. The rationale to include these other disciplines is because they are often pre-requisites for Biology courses in second and third year.

The Biology FPM Agreement is intended to clarify and simplify transfer arrangements for students wishing to transfer between British Columbia post-secondary institutions in order to undertake a major in Biology, typically after the second year of study. Participating departments and institutions have identified core course and credit areas, and have specified the number and type of courses required, without specifying particular course requirements for each institution. This provides a measure of flexibility in course selection, while ensuring that students have a clear idea of the requirements of receiving institutions.

Most post-secondary institutions use a credit format that equates one semester course of three hours a week as a three-credit course, although there are a few exceptions, such as four-credit courses at Simon Fraser University and the University College of the Fraser Valley. For the purposes of this Agreement, courses will be listed without credits. A single course is defined as a course taken over a single term. A course that extends over two terms (such as PHYS 102 at University of Victoria) will be categorized as two courses for the purposes of this agreement.

Description of the Biology FPM Agreement

The Biology FPM Agreement consists of a listing of requirements for students completing the Biology FPM (Attachment 1). For each degree-granting institution, notations are provided that are specific for that institution.

The following institutions have signed on to the Biology FPM Agreement (Attachment 2):

- Degree-granting Institutions: Simon Fraser University, Thompson Rivers University, Trinity Western University, University of British Columbia – Vancouver, University of British Columbia – Okanagan, University of the Fraser Valley, University of Victoria, Vancouver Island University.
- Sending Institutions: Capilano University, College of the Rockies, Douglas College, Langara College, North Island College, Norwest Community College, Okanagan College, Selkirk College, College of New Caledonia, Yukon College.

In total, eight degree-granting institutions and ten sending institutions have signed the Agreement. It is anticipated University of Northern British Columbia will sign. This represents 90% of the degree-granting institutions and over 90% of the Sending Institutions, excluding private colleges and universities.

Limitations

- None of the courses constituting the requirements for the Biology Flexible Pre-Major may substitute for upper level credits in the receiving institution.
- Students are advised that the Flexible Pre-Major does not guarantee acceptance into Biology major programs, as acceptance depends on students obtaining a competitive GPA as specified by the receiving institution and completion of other requirements deemed necessary.
- The Flexible Pre-Major does not excuse students from non-discipline specific requirements of programs at the receiving institution, such as English, humanities or science credits. Students are encouraged to examine the total program requirements of receiving institutions prior to applying for transfer.
- The Flexible Pre-Major transfer agreement supplements and does not supersede existing articulation agreements in the BC Transfer Guide.

Expanding the Number of FPM Signatories

The Biology Articulation Committee will encourage the few remaining institutions to sign the Biology FPM Agreement. The Chair of the Committee should oversee the process, and the addition of more institutions to the agreement will be part of the updating process.

At the May 2015 Biology Articulation Committee Meeting, representatives of Kwantlen Polytechnic University and Camosun College indicated they will pursue the participation of their institution. This would then represent a virtual 100% participation rate in the Agreement, excluding private colleges and universities.

Updating the Biology FPM

It is recognized the elements of the Biology FPM may change over time. The Biology Articulation Committee meets in the spring of each year. Prior to the date of the next meeting, the Chair will solicit suggested changes or updates to courses of institutions included in this transfer agreement, and bring them forward to the committee at the annual meeting for discussion, decision, and subsequent posting to the BC Transfer Guide website.

Attachment 1 – Biology Flexible Pre-Major Transfer Agreement (2015)

The Biology Flexible Pre-Major (FPM) has been established to allow students to meet the lower level requirements for a major prior to transfer, typically after the second year of study. The list of courses meet the first and second year Biology major subject area requirements of a number of degree-granting institutions, thus assisting students with program planning and allowing them to keep multiple options open when they transfer into third year.

The Biology FPM Agreement is intended to clarify and simplify transfer arrangements for students wishing to transfer between British Columbia post-secondary institutions in order to undertake a major in Biology, typically after the second year of study. Participating departments and institutions have identified core course and credit areas, and have specified the number and type of courses required, without specifying particular course requirements for each institution. This provides a measure of flexibility in course selection, while ensuring that students have a clear idea of the requirements of receiving institutions.

Most post-secondary institutions use a credit format that equates one semester course of three hours a week as a three-credit course, although there are a few exceptions, such as four-credit courses at Simon Fraser University and the University College of the Fraser Valley. For the purposes of this Agreement, courses will be listed without credits. A single course is defined as a course taken over a single term. A course that extends over two terms (such as PHYS 102 at University of Victoria) will be categorized as two courses for the purposes of this agreement.

It is recognized the elements of the Biology FPM may change over time. The Biology Articulation Committee meets in the spring of each year. Prior to the date of the next meeting, the Chair will solicit suggested changes or updates to courses of institutions included in this transfer agreement, and bring them forward to the committee at the annual meeting for discussion, decision, and subsequent posting to the BC Transfer Guide website.

While the Biology FPM is intended to assist students in their progression through a Biology B.Sc., students should make themselves aware of other majors, double majors, joint majors, and minors in their prospective receiving institution(s) that may interest them. Students should consult early in their degree progression with academic or faculty advisors at their sending and prospective receiving institutions in order to maintain optimal flexibility in program choice after transfer to the receiving institution.



Biology Flexible Pre-Major Transfer Agreement (2015)

The Biology Flexible Pre-Major Agreement consists of the following sections:

1. A listing of requirements for students completing the Biology FPM with notations from individual degree-granting institutions
2. A listing of course equivalencies for institutions participating in the Biology FPM Agreement
3. Limitations and caveats of the Biology FPM

Section 1 – Biology Flexible Pre-Major Requirements

The Biology Flexible Pre-Major requires that students take:

- Two introductory (1st year) Majors Biology courses with labs
- Two introductory (1st year) Chemistry courses with labs
- Two introductory (1st year) Calculus courses
- Two introductory (1st year) physics courses with labs
- A 2nd year course in Genetics
- A 2nd year or higher level course in Cell Biology
- A 2nd year or higher level course in Biochemistry
- A 2nd year course in Ecology
- Two courses in Organic Chemistry with labs
- In total, a Biology FPM consists of 14 courses. See Table 1 for list of courses and equivalencies

Specific requirements and general comments from degree-granting institutions before a student may move to 3rd year:

- Simon Fraser University
 - physics courses with no labs are acceptable
 - STAT 201 is required; however if it is not available, the course should be taken at SFU as early as possible
 - for the Molecular Biology and Biochemistry major, no ecology is required
- University of British Columbia – Vancouver
 - Students must take at least one organismal course in 2nd year
 - Students with Physics 12 may require only one physics course
 - Physics must be calculus-based.
 - Biochemistry is not required but is a prerequisite for some 3rd year biology courses.
- University of British Columbia – Okanagan

- Students must take a 2nd year statistics course and two organismal courses in 2nd year
- University of Northern British Columbia
 - Students must take one 1st year written communication course
 - Students must take a 2nd year statistics course at least two organismal courses in 2nd year
 - Only one course in Calculus is required but two courses are recommended
 - Organic chemistry courses with no labs are acceptable but labs are recommended
- University of Victoria
 - Students must take a 2nd year statistics course
 - Only one course in Calculus is required; the second 1st year Calculus course may be replaced by Finite Mathematics
- Thompson River University
 - No specific requirements or additional comments
- Trinity Western University
 - Only one course in Calculus is required but two courses are recommended
 - Physics courses must be calculus-based
 - Ecology, Genetics, and Biochemistry may be postponed to 3rd year
- Vancouver Island University
 - Students wishing to take the Microbiology stream must take a 2nd year Microbiology course
- University of Fraser Valley
 - All science courses must have a lab component

Section 2 – Listing of Course Equivalencies for Institutions participating in the Biology FPM Agreement

First Year program at each Degree Granting Institution

Institution	Majors Biology	Chemistry	Calculus	Physics
Simon Fraser University	BISC 101/102	CHEM 121/122/281/126	MATH 150 or 151 or 154 and 152 or 155	PHYS 101/102 or 120/121 or 125/126 or 140/141
Thompson Rivers University	BIOL 1110/1210	CHEM 1500/ 1510 or 1520	MATH 1140/1240 or 1150/1250	PHYS 1100/1200 or 1150/1250
Trinity Western University	BIOL 113/114	CHEM 111/112	MATH 123/124 or MATH 123 and stats or CPS	PHYS 111/112
University of British Columbia Okanagan	BIOL 116/125	CHEM 111/113 or 121/123	MATH 100/101	PHYS 111/102 or 112/122
University of British Columbia Vancouver	BIOL 112/140/121	CHEM 121/123	MATH 100, 102, 104, 110, 120, 180 or 184 and 101, 103, 105 or 121	PHYS 101
University of the Fraser Valley	BIO 111/112	CHEM 111 or 113 and 112 or 114	MATH 111/112 or MATH 118	PHYS 105 or 111/112
University of Northern British Columbia	BIOL 103/104/123/124	CHEM 100/101/120/121	MATH 152 or 100 or 105 (3)	PHYS 100/101 or 110/111
University of Victoria	BIOL 184/186	CHEM 101/102	MATH 100/101 or 102/151	PHYS 102 or PHYS 110/111 or 120/130
Vancouver Island University	BIOL 121/123	CHEM 140/141 or 142	MATH 121/122	PHYS 111/112

First Year program at Sending Institutions

Institution	Majors Biology	Chemistry	Calculus	Physics
Capilano University	BIOL 110/111	CHEM 110/111	MAT 108 or 116/126	PHYS 114/115 or 104/105
College of New Caledonia	BIO 107/120	CHEM 111/112 OR 113/114	MATH 101/102	PHYS 101/102 OR 105/106
College of the Rockies	BIOL 101/102	CHEM 101/102	MATH 103/104	PHYS 103/104
Douglas College	BIOL 1110/1210	CHEM 1110/1210	MATH 1120/1220	PHYS 1110/1210 or 1107/1207 or 1108/1208/1308
Langara College	BIOL 1115/1215	CHEM 1120 and 1220	MATH 1171 and 1271	PHYS 1118/1101 or 1125/1225
North Island College	BIO 102/103	CHE 110/111	MAT 181/182 or 102/151	PHY 101/102 or 120/121
Northwest Community College	BIOL 101/102	CHEM 101/102 or 121/122	MATH 101 and one other math	PHYS 101/102 or 121/122
Okanagan College	BIOL 111/121	CHEM 111/121 or 112/122	MATH 112 and one other math	PHYS 111/121 or 112/122
Selkirk College	BIOL 104/106	CHEM 110 or 122/125	MATH 100/101	PHYS 102/103 or 104/105
Yukon College	BIOL 101/102	CHEM 110/111	MATH 100/101	PHYS 101/102

Second Year program at each Degree Granting Institution

Institution	Organic Chem	Cell	Genetics	Ecology	Biochem	Other
Simon Fraser University	CHEM 282/283	MBB 231	BISC 202	BISC 204	MBB 222	
Thompson Rivers University	CHEM 2120/2220	BIOL 2130	BIOL 2340	BIOL 2170	<i>BIOL 3130</i>	BIOL 2160 (Micro), 2280 (Plants), 2290 (Animals), 2300 (Communications)
Trinity Western University	CHEM 221/222	BIOL 223	<i>BIOL 371</i>	<i>BIOL 381</i>	<i>BIOL 384</i>	
University of British Columbia Okanagan	CHEM 203/204 or 213/214	BIOL 200	BIOL 265	BIOL 201	<i>BIOL 311</i>	2 other electives: 204(Verts), 205 (Inverts), 209 (non Vasc), 210 (Vasc plants), 228 (Micro)
University of British Columbia Vancouver	CHEM 233/235 or 203	BIOL 200	BIOL 234	BIOL 230	BIOL 201	2 other electives, one of which may be postponed to 3 rd year: BIOL 203 (Protists), 204 (Verts), 205 (Inverts), 209 (Non-vascular), 210 (Vascular), MICB 201 (Micro)
University of Fraser Valley	CHEM 213 + one other	BIO 201	BIO 220	BIO 210	BIO 202	
University of Northern British Columbia	CHEM 201/203	<i>3rd BIOL 311</i>	BIOL 210	BIOL 201	CHEM 204	BIOL 202 (Inverts), 203 (Micro), 204 (Plants)
University of Victoria	CHEM 231/232	BIOL 225	BIOL 230	BIOL 215	BIOC 299	
Vancouver Island University	CHEM 231/232	BIOL 200	BIOL 212	BIOL 202	BIOL 201	BIOL 210 (Micro), 223 (Botany)

Second Year program at Sending Institutions

Institution	Organic Chem	Cell	Genetics	Ecology	Biochem	Other
Capilano University	CHEM 200/201	BIOL 214	BIOL 200	BIOL 208	BIOL 215	BIOL 210 (Plants), 212 (Inverts), 213 (Verts), 222 (Micro)
College of New Caledonia	CHEM 203/204	BIOL 201	BIOL 220		BIOL 202	
College of the Rockies	CHEM 201/202	BIOL 201	BIOL 203	BIOL 204	BIOL 202	BIOL 200 (Micro), 208 (Verts), 207 (NV plants)
Douglas College	CHEM 2321/2421	BIOL 2321	BIOL 3205	BIOL 3505	BIOL 2421	BIOL 2400 (Micro), 3500 (Plants), 3600 (Comp. Zool), 3700 (evolution)
Langara College	CHEM 2316/2416	BIOL 2415	BIOL 2330	BIOL 2380/2480	BIOL 2315	BIOL 2340 (Plants), 2370/2470 (Micro), 2450 (Inverts), 2350 (Verts), 2430 (Molecular genetics)
North Island College	CHE 200/201	BIO 200	BIO 202	BIO 230	BIO 201	BIO 211 (Inverts), 215 (Micro)
Northwest Community College	CHEM 230/231	BIOL 205	BIOL 215	BIOL 211	BIOL 206	BIOL 201 (Inverts), 208 (Botany), 213 (Micro), 235 (Ichthyology)
Okanagan College	CHEM 212/222	BIOL 211	BIOL 224	BIOL 203	BIOL 220	BIOL 254 (Verts), 228 (Micro) 251 (plants)
Selkirk College	CHEM 212/213	BIOL 204	BIOL 202	BIOL 200	BIOL 206	BIOL 210 (Plants), 212 (Micro), 214 (Verts)
Yukon College	CHEM 210/211	BIOL 201	BIOL 202	BIOL 220		



Biology Flexible Pre-Major Transfer Agreement (2015)

Section 3 – Limitations and caveats of the Biology Flexible Pre-Major

- None of the courses constituting the requirements for the Biology Flexible Pre-Major may substitute for upper level credits in the receiving institution.
- Students are advised that the Flexible Pre-Major does not guarantee acceptance into Biology major programs, as acceptance depends on students obtaining a competitive GPA as specified by the receiving institution and completion of other requirements deemed necessary.
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- The Flexible Pre-Major transfer agreement supplements and does not supersede existing articulation agreements in the BC Transfer Guide.

Based on the Biology Flexible Pre-Major as outlined, we agree to participate:

Institution: _____

Institution Representative:

Name: _____

Title: _____

Email: _____

Signature: _____

Date: _____

Attachment 2 – List of Signing Authorities for Biology Flexible Pre-Major Transfer Agreement

Institution	Signing Authority
Simon Fraser University	Chair, Departmental Undergraduate Curriculum Committee, Erin Barley,
Thompson Rivers University	Chair, Department of Biological Sciences, Dr. Ron Smith
Trinity Western University	Acting Dean of Faculty of Natural and Applied Sciences, Dr. Craig Montgomery
University of British Columbia – Okanagan	Unit Head, Department of Biology, Dr. Michael Deyholas
University of British Columbia – Vancouver	Associate Head of Biology Shona Ellis
University of the Fraser Valley	Dean, Faculty of Science, Dr. Lucy Lee
University of Northern British Columbia	Dean, College of Science and Management, Dr. Dan Ryan
University of Victoria	Chair, Department of Biology, Dr. Kerry Delaney; Dean, Faculty of Science, Dr. Rob Lipson; VP Academic and Provost, Dr. Valerie Kuehne
Vancouver Island University	Dean, Science and Technology, Dr. Donald Noakes
Capilano University	Dean, Faculty of Arts and Sciences, Dr. Julia Denholm
College of the Rockies	President and CEO, Dr. David Walls
Douglas College	Dean, Faculty of Science & Technology, Dr. Brian Chapell
Langara College	Dean, Faculty of Science, Dr. Margaret Heldman

North Island College	Dean, School of University & Applied Studies, Dr. Gregory Cran
Northwest Community College	Dean of Instruction, Tanya Rixin
Okanagan College	Vice-President, Department of Education, Dr. Andrew Hay
Selkirk College	Vice-President, Education & Students, Dr. Neil Coburn
College of New Caledonia	Interim Dean, School of University Studies and Career Access, Dr. Victoria Abboud
Yukon College	Dean, Applied Science and Management, Dr. Margaret Dumkee