Biotech Pathways Credit Equivalencies – Honours Specialization Biology, Nipissing University

BIOL 1006

CHEM 1006

CHEM 1007

CHEM 2306 – Introduction to Organic Chemistry I

BIOL 2116 (Principles of Microbiology)

BIOL 2206 (Principles of Biochemistry)

BIOL 3126 (Molecular Biology Techniques)

2 of:

- CHEM 2307 – Introduction to Organic Chemistry II
- CHEM 2106 – Introduction to Analytical Chemistry
- BIOL 4227 – Nutrition

Biotech Pathways Credit Equivalencies – Honours Specialization Biology, Nipissing University

2 of:

- BIOL 2407 (Environmental Toxicology)
- NURS 2037 (Pharmacology)
- CRJS 2926 (Introduction to Forensics)

3 of:

- BIOL 3306 (Enzymology)
- BIOL 3346 (Microscopy Methods & Applications)
- BIOL 3557 (Genetics & Society)
- BIOL 3597 (Immunology)

Total 54 credits – need 2 more courses to make this a 2-year straight transfer – might be difficult to accomplish

1 1000-level MATH

1 1000-level COSC

1 1000-level Humanities

1 1000-level Social Science/Professional Studies

BIOTECH Pathways – CREDIT TRANSFER PLAN
Honours Specialization in Biology – Nipissing University

	Year 1		Year 2		Year 3		Year 4	
	BIOL Requires	**College Equivalency**	**BIOL Requires**	**College Equivalency**	**BIOL Requires**	**College Equivalency**	**BIOL Requires**	**College Equivalency**
	Biol 1006	Yes	Biol 2446	No	Biol 3117	No	9 credits 4000	No
	Biol 1007	No	Biol 2557	No	12 credits 3000	Yes		
	Chem 1006	Yes	Biol 2336 or Biol 2337	No	18 credits 2000-4000	No		
	Chem 1007	Yes	Biol 2836 or Biol 2837	No				
	Math 1000 level	Yes	Additional 2nd year Biology - Chemistry	21 @ 2000				
	Required Electives							
	3 credits science	Yes	3 credits science	No				
	3 credits humanities (Acad 1601)	Yes	3 credits humanities	No				
	3 credits social science - professional studies	Yes	3 credits social science - professional studies	No				
Total	**30**	**21**	**30**	**21**	**30**	**12**	**30**	**0**
Cumulative	**30**	**21**	**60**	**42**	**90**	**54**	**120**	**54**

BIOTECH Pathway – Remaining Required Credits
Honours Specialization in Biology – Nipissing University

1000 level

- Biol 1007 (Organismal/Evolutionary Bio)
- 3 credits science
- 3 credits humanities
- 3 credits social science - professional studies

2000 level

- Biol 2446 (Principles of Ecology)
- Biol 2557 (Genetics)
- Biol 2336 or Biol 2337 (Biology of Seed/Seedless Plants)
- Biol 2836 or Biol 2837 (Invertebrate/Vertebrate Zoology)

3000/4000 level

- Biol 3117 (Biostatistics)
- 18 credits 2000-4000 Biol
- 9 credits 4000 Biol

Remaining proscribed courses described above constitute 54 credits. Including 54 transfer credits, students require an additional 12 credits to complete 120 credits for graduation.

Staged Program Expectations For NU Biology

A) At the completion of **1000-level courses**, successful students will have demonstrated the following abilities:

NU Learning Outcome	BIOTECH STANDARD (3YR)[1]			
	V[2]	GS	GE	Met[3]
a fundamental knowledge and understanding of some key concepts and methodologies of biology	4,6,7	3,6,7	6	Yes
an ability to comprehend biological information at various levels of hierarchy (such as molecular, cellular, whole-organism, and ecological)	4,7,8	7,8	6,7	Partial
recognition of the role that data play in developing the fundamental theories and concepts of biology	1,5,8,9	2,3,4,7,8	6	Yes
a promising ability to use established laboratory and field techniques	1,4,5,6,7	3,4		Yes
a promising ability to communicate ideas in a technically correct manner	2,8,9	1,2,5,8		Yes
an ability to recognize the role of biology in society	2,3,8,9	8,9,11	5,6,7	Yes

Notes

[1] Source: Biotechnology Technologist Program Standard, 1999, Ontario Ministry of Education and Training.

[2] V = Vocational Learning Outcomes; GS=Generic Skills Learning Outcomes; GE = General Education.

[3] Met = Yes or Partial.

Staged Program Expectations For NU Biology

B) At the completion of **2000-level courses**, successful students will have demonstrated the following abilities:

NU Learning Outcome	BIOTECH STANDARD (3YR)[1]			
	V	GS	GE	MET
a broad understanding of the key concepts and methodologies of biology	4,6,7	3,6,7	6	Partial
an ability to interpret biological information at various levels of hierarchy (such as molecular, cellular, whole-organism, and ecological)	8	7,8	6,7	Partial
an ability to formulate analytical questions	5	6,8	6	Partial
demonstration of the ability to collect high-quality data	1,5,8	3,4,7,12		Yes
an ability to use established laboratory and field techniques	1,4,5,6,7	3,4		Yes
a general understanding of research methods	1,4,5,6,7,9	3,4,6,7,9	6	Yes
an ability to communicate ideas in a clear, correct manner	2,8,9	1,2,5,8		Yes
an ability to assess and appreciate the role of biology in society	2,3	8,9,11	5,6,7	Yes

Notes

[1] Source: Biotechnology Technologist Program Standard, 1999, Ontario Ministry of Education and Training.

[2] V = Vocational Learning Outcomes; GS=Generic Skills Learning Outcomes; GE = General Education.

[3] Met = Yes or Partial.

Staged Program Expectations For NU Biology

C) At the completion of **3000-level courses**, successful students will have demonstrated the following abilities:

NU Learning Outcome	BIOTECH STANDARD (3YR)[1]			
	V	GS	GE	MET
a detailed knowledge of the key concepts and methodologies of biology, including some knowledge of specific sub-disciplines of biology	4,5,6,7	3,6,7	6	Partial
an ability to interpret biological information at various levels of hierarchy, and an ability to access and apply relevant information from the primary literature	4,5,8,9	2,7,8	6,7	Partial
an ability to gather, review, and assess specialized biological information from at least one of the sub-disciplines of biology	1,2,4,5,6 ,7,9	2,7,8		Yes
an ability to develop and support analytical arguments	5,8,9	1,2,6,7,8	6	Partial
an ability to compare the merits of different critical and theoretical approaches	5	3,4,7,8	6	Partial
an ability to contribute to the planning, collection and analysis of high-quality data	1,2,4,5,6 ,7,8,9	3,4,7,12		Yes
an ability to use specialized laboratory and field techniques	4,5,6,7	3,4		Yes
a developed understanding of research methods	4,5,6,7	3,4,6,7,9	6	Partial
an ability to communicate logical, analytical arguments in clear, correct, convincing manner	8,9	1,2,5,8		Yes
an ability to apply biological concepts and information to solutions of problems faced by society such as declining biodiversity, management of resources, and control of invasive species	3	8,9,11,1 2	5,6,7	Partial

Notes

[1] Source: Biotechnology Technologist Program Standard, 1999, Ontario Ministry of Education and Training.

[2] V = Vocational Learning Outcomes; GS=Generic Skills Learning Outcomes; GE = General Education.

[3] Met = Yes or Partial.

Staged Program Expectations For NU Biology

D) At the completion of **4000-level courses**, successful students will have demonstrated the following abilities:

NU Learning Outcome	BIOTECH STANDARD (3YR)[1]			
	V	GS	GE	MET
a detailed knowledge and critical understanding of the key concepts, methodologies, and theoretical approaches of biology including some in-depth knowledge of a specific area of study or specific sub-discipline	4,5,6,7	3,6,7	6	Partial
demonstration of original thought that is clearly distinguished from ideas arising from other sources such as biological literature		6,8,9		??
a developed ability to comprehend, distinguish, and analyze biological information from various sub-disciplines and a developed ability to gather, review, and evaluate primary literature relevant to at least one of the major sub-disciplines of the biological sciences	1,2,4,5,6,7,9	2,7,8	6,7	Partial
an advanced ability to develop and support analytical arguments	5,8,9	1,2,6,7,8	6	Yes
an ability to formulate an appropriate topic for research and to complete a sustained research paper or an original thesis	1,4,5,6,7,9	2,3,4,6,7,8,9,10		Partial
honours students must have the ability to take independent responsibility for all stages of data collection and analysis in support of their thesis projects	1,4,5,6,7,9	2,3,4,6,7,8,9,10		Yes
an advanced knowledge of specialized the research methodologies of one or more sub-disciplines of biology	4,5,6,7	3,4,6,7,9		Yes
an advanced understanding of the nature and purpose of critical enquiry in the biological sciences through application of the scientific method	4,5,6,7,8,9	2,3,4,6,7,8,9	6,7	Partial

Notes

[1] Source: Biotechnology Technologist Program Standard, 1999, Ontario Ministry of Education and Training.

[2] V = Vocational Learning Outcomes; GS=Generic Skills Learning Outcomes; GE = General Education.

[3] Met = Yes or Partial.

Staged Program Expectations For NU Biology

D) At the completion of **4000-level courses**, successful students will have demonstrated the following abilities:

NU Learning Outcome	BIOTECH STANDARD (3YR)[1]			
	V	GS	GE	MET
an ability to initiate critical discussion and to participate in a sustained scholarly conversation	9	1,2,6,7, 8		Partial
an ability to communicate, both orally and in written work, complex ideas and analyses in a clear, concise, correct, and professional manner	9,10	1,2,5,8		Yes
an ability to synthesize and apply the knowledge gained from the various courses they have taken in their program of study	8,9	2,7	4,6,7	Partial
an ability to extend current biological concepts and information to hypothetical discussions about the margins of biological knowledge		8,9		??
an ability to carry out all of the above either independently or as part of a group				??

Notes
[1] Source: Biotechnology Technologist Program Standard, 1999, Ontario Ministry of Education and Training.
[2]V = Vocational Learning Outcomes; GS=Generic Skills Learning Outcomes; GE = General Education.
[3]Met = Yes or Partial.

Additional Information/Considerations

Admission Requirements:
Graduates of a Biotechnology (3 year) Advanced Diploma with a sufficient amount of academic content, and who have achieved a minimum B or 70% average may be considered for admission to the Honours Specialization in Biology and will be eligible for a minimum of 54 transfer credits, as assigned.

Bridging Models:
Distance/online – might work in collaboration with Nipissing's Centre for Flexible Teaching & Learning to develop this. However, since at the current time BIOL1007 is offered only in the winter semester, and is a prerequisite for many of the courses students would be required to complete in the Biology program at Nipissing (see slide 4), options are limited in terms of the courses students might be able to enroll in during a bridging semester or via distance education. In consultation with the Department, it was agreed that we would prefer to not open up the option for students to complete a BIOL1007 'equivalent' online without a laboratory component.

Also note that summer sessions are not really an option for bridging core courses (e.g. BIOL1007), as generally only electives are offered during summer sessions. Students might, however, take electives during the summer semester following their first semester of enrolment, in order to complete program requirements within < 2 calendar years.

Pathways Template – BIOTECH Advanced Diploma

Please specify who your pathway is for: Graduates of Biotechnology Diploma (2 year) or Biotechnology Advanced Diploma (3 year)	**Biotechnology Advanced Diploma (3 year)**
Degree Program	**Honours Specialization in Biology**
Admission Criteria	
Average	**70%**
Other Admission Selection Criteria	
Credits Granted	
Total # of Transfer Credits/Full Courses Granted	**54 credits (18 courses)**
Biological Science	**21-27 credits (7-9 courses)** ***this will depend on the specific college program from which an applicant has obtained a diploma, as appropriate, as indicated in slides 1&2* *(note: many of these are 'electives' in the sense that they are not required core courses for the program)*
Math/ Other Science	**21-27 credits (7-9 courses)** ***this will depend on the specific college program from which an applicant has obtained a diploma, as appropriate, as indicated in slides 1&2* *(note: many of these are 'electives' in the sense that they are not required core courses for the program)*
Analytical/ Laboratory Skills	
Social Science/ Management	**6-12 credits (2-4 courses)** ***this will depend on whether a student may claim credit for CRJS2926 and/or BIOL3557, and whether they choose to 'count' those courses as humanities or sciences credits towards their remaining degree requirements*
Other/General Education Requirements	
Electives	

Pathways Template – BIOTECH Advanced Diploma

Point of Entry (Summer, Winter, Fall)	**Winter Entry** - would offer students the most flexibility in terms of choice of which of their remaining required courses they might wish to register in (since BIOL1007 is offered in the winter and is a prerequisite for many of the other credits remaining to be completed) **Fall Entry** – would also be possible, but students would have no choice in which of the remaining credit requirements they would be required to fulfill during the first two academic semesters ** see slide 4
Degree Requirements	
# of Credits to be Completed	**54 proscribed required credits + 12 elective credits** ** see slide 4
Bridging	Since at the current time BIOL1007 is offered only in the winter semester, and is a prerequisite for many of the courses students would be required to complete in the Biology program at Nipissing (see slide 4), options are limited in terms of the courses students might be able to enroll in during a bridging semester or via distance education.
Specific Courses/Codes	Biol 1007 (Organismal/Evolutionary Bio) 3 credits science 3 credits humanities 3 credits social science - professional studies Biol 2446 (Principles of Ecology) Biol 2557 (Genetics) Biol 2336 or Biol 2337 (Biology of Seed/Seedless Plants) Biol 2836 or Biol 2837 (Invertebrate/Vertebrate Zoology) Biol 3117 (Biostatistics) 18 credits 2000-4000 Biol 9 credits 4000 Biol
Other Comments or Requirements	