Proposal for a Degree Completion Pathway

Allowing Biotechnology Technologist 3-year Diploma College Students to complete a UOIT Honours Bachelor of Science degree in

Biological Science – Complementary studies

Faculty of Science

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1. INTRODUCTION

a. Background

When UOIT was created on June 27, 2002, the University of Ontario Institute of Technology Act states that a Special Mission of UOIT is "to facilitate student transition between college-level programs and university-level programs". This has led to a mandate to develop innovative pathways to facilitate access of college students to UOIT and vice versa. Recent government initiatives have also indicated the need for increasing collaboration between colleges and universities. Such collaboration allows students to further their education, helping them reach their full potential and preparing them for demands of the current and future marketplace.

Several College-UOIT pathways have been created since 2005, including Bridge Programs from college diploma programs to UOIT honours programs in Commerce, Information Technology, Communication, Health Sciences, Legal Studies, and Criminology and Justice Studies. In addition, several programs have been created allowing UOIT Honours BSc graduates to transfer into Durham College "compressed fast-track" diploma programs. However, no pathway is currently available for college students to transfer into UOIT science programs. Indeed, such pathways from Ontario colleges into honors science programs are extremely rare across Ontario. In the vast majority of cases, universities only give transfer credits for a selected limited number of college courses.

This proposal describes a Degree Completion pathway allowing appropriately prepared students graduating from a **Biotechnology Technologist** 3-year Diploma program in the Ontario college system to complete a **Bachelor of Science (Honours) in Biological Sciences - Complementary Studies** in the Faculty of Science at UOIT within a period of two calendar years (a Bridge Semester followed by 5 semesters, including a 3-course spring semester). The UOIT Biological Sciences program provides students with a strong knowledge base in disciplines such as cell biology, genetics/molecular biology, physiology, microbiology, biochemistry and developmental biology. It is relatively unique in Ontario in providing them with core foundational knowledge in all the basic sciences, including physics, chemistry and mathematics. All courses in the program are supported by state-of-the art laboratories, classrooms and computing infrastructure. The Complementary Studies specialization in the Honors BSc in Biological Sciences program provides a broad background in biological science.

Apart from a required module in the Bridge Semester, all courses in the proposed pathway are currently offered by the Faculty of Science, making it very efficient and economical to implement.

b. Student Demand

Although the proposed pathway has been developed in co-operation with Durham College faculty, it is not restricted to Durham College graduates, but is open to any three-year Biotechnology Technologist diploma graduates from colleges throughout Ontario. This is in view of the fact that all such college programs satisfy a universal set of learning outcomes. This proposal is quite different from other articulation programs, which have been largely developed through specific agreements between a given college and a university (see some examples in the duplication section below). We believe that the program described here will be attractive to many students graduating from the Biotechnology Technologists program offered in Colleges throughout Ontario. Seven students from Durham College have already expressed strong interested in the program on the basis of their knowledge that discussions have been taking place.

Projected enrolment levels for the first five years of operation and the steady-state enrolment are given in the Business Plan in Section of this document.

c. Societal Need

Biotechnology is one of the fastest growing industries in the world and Canada is the third highest employer in the biotech industry, according to Statistics Canada. Students with strong technical skills acquired from their college diploma, and critical thinking and analytical skills obtained from their university degree will be in high demand in today's knowledge-based economy.

d. Duplication

As noted, the program has been developed for students from colleges throughout Ontario graduating from a three-year Biotechnology Technologist diploma program. Appropriately prepared students are accepted into the 5-semester degree completion portion of the pathway after successful completion of a 2-course (plus a short course module) one-semester Bridge Program. This differs from other Ontario college-university transfer programs, whereby students can only enter a university with which their college has a specific articulation agreement. We have found 8 Ontario Colleges that offer the Biotechnology Technologist Diploma program. These are listed in the table below. According to information on The Ontario College University Transfer Guide website (http://www.ocutg.on.ca/) and on relevant college and university websites, 6 of these have articulation agreements from this program to Ontario university programs; 2 of the latter are General (rather than Honours) BSc programs. Finally, only two articulation agreements allow completion of an Honours BSc in a biological science program in two academic years.

College offering the Biotechnology Technologist three-year program	University science degree program into which students may transfer	Comments
Seneca	B Sc (General) in Biotechnology at York University	Students who complete the first 5 semesters at Seneca, with a cumulative GPA of 3.3 can apply to the Biotechnology program at York University and will be eligible for a maximum of 45 transfer credits.
Seneca	BSc (Unspecialized) at Guelph	The University of Guelph will reserve 10 spaces per year for Seneca graduates who have at least a 3.5 GPA or 'B+' average. Students may be granted up to 7.5 credits, enabling the completion of a General BSc in 3 full-time semesters and Honours BSc in 6 full-time semesters.
Algonquin	BSc (Honours) in Applied Bio-molecular Science at Lakehead University	Students must have graduated from the Biotechnology Technologist Diploma program from Algonquin College with an average of 70% or a GPA of at least 3.0 out of a 4 point scale. Students will be granted non-transferable credit for two years (10 full course equivalents (FCE)) towards the Honours Bachelor of Science in Applied Bio-molecular Science degree. Students who follow the regular course of study as outlined by this articulation agreement will be able to complete this program in two academic years.
Loyalist	BSc (Honours) in Biology at Trent University	Upon successful completion of the six semester Biotechnology Technologist advanced diploma program at Loyalist College, graduates with a minimum 75% cumulative program average will be eligible to make application to the Bachelor of Science (Honours) program at Trent University. Students receive credit transfer for specific courses. Anticipated normal schedule of student progression is approximately two years.
Fleming - *Biotechnology Technologist Forensics*	BSc (Honours), (Joint-Major) or Bachelor of Arts (Honours), (Joint-Major) at Trent University	Upon successful completion of the five semester *Biotechnology Technologist Advanced Diploma*

		program at Fleming College, graduates with a minimum 75% cumulative program average will be eligible to make application to the *Bachelor of Science (Honours)* or *Bachelor of Arts (Honours)* Joint-Major program at Trent University. Trent University will grant direct entry and assign 7 transfer credits, as outlined in Appendix A: Part, I towards the successful completion of a 20-credit honours degree, BSc or BA
Centennial- Biotechnology Technologist – Industrial Microbiology	BSc (General) at Ryerson University	A CAAT Advanced Diploma in Biotechnology-Industrial Microbiology with a minimum cumulative grade point average of B+ (3.5) is required for Advanced Standing admission consideration. Successful applicants admitted to first year, and granted transfer credit equivalent to one full year of study.
Durham	None in Ontario	Athabasca university: 60 transfer credits awarded toward a total of 120 for degree completion
St Lawrence	None found	
Canadore	None found	

2. DEGREE REQUIREMENTS

a. Program learning outcomes

1. Depth and breadth of knowledge

Students will develop strong background knowledge in various disciplines of biology including cell biology, physiology, genetics and molecular biology, biochemistry, developmental biology and microbiology while gaining more in-depth knowledge in specific areas of interest. Graduates of this program will be able to demonstrate the ability to:

- apply comprehensive knowledge of the concepts, theories and principles in the biological sciences as they relate to the processes and mechanisms of life from molecular to cellular, and from organism to community
- utilize knowledge to analyze, evaluate, and apply the scientific concepts, techniques or processes needed in the study and conduct of biological science
- Develop both theoretical knowledge and experimental skills that pertain to different disciples in biology
- use well developed strategies to update knowledge, maintain and enhance learning
- develop critical thinking and analytical skills throughout their program in both core Science and elective courses
- develop an interdisciplinary perspective through both core and elective courses offered in the Faculty of Science and other faculties such as the Faculty of Social Science and Humanities

2. Knowledge of Methodologies

As an interdisciplinary degree, students will learn a variety of laboratory techniques pertaining to different disciplines of biology, as well as some basic laboratory techniques in chemistry and physics, quantitative analyses in mathematics and statistics and a variety of computer software applications for writing, data analysis and modeling. Graduates of this program will be able to demonstrate the ability to:

- understand and utilize contemporary laboratory and measurement techniques, procedures, safety protocols and equipment necessary for biological sciences, and to some extend chemistry and physics
- apply relevant numerical skills, including statistical analysis, to the study and analysis of experimental data
- plan and implement experiments and investigations, critically examine the results and draw valid conclusions
- develop skills in bioinformatics and other leading-edge software used in the various disciples studied

3. *Application of knowledge*

Activities such as problem-based learning assignments, case-based analysis, individual and group projects and presentations will be designed to motivate students to apply basic knowledge to different life situations and to challenge them to:

- critically assess the validity of the scientific information they are exposed to by the media as well as the one found in the scientific literature
- explore the current state of knowledge in biosciences and investigate innovative solutions to significant biological problems
- appreciate and evaluate the importance of new and emerging technologies in biological sciences
- examine the social, cultural, ethical, environmental, safety and economic consequences of bioscience-based developments, in local, national and global contexts
- use current Information Technology to access, store, and retrieve information, to acquire and process data, and to analyze and solve problems

4. Communication skills

Throughout the program, students have an opportunity to learn to effectively communicate, either through written reports and assignments or via oral presentations. They will therefore learn to:

- communicate effectively in written, spoken and visual format with both technical experts and with members of the general public on science issues
- explain the principles and practices of sustainable development and impact of human activities on living systems and vice versa

5. *Awareness of limits of knowledge*

Students will learn to evaluate the level of uncertainty in experimental results and theoretical predictions in light of the diversity and variability in living systems, fostering in them to keep an open mind as biological systems may be quite unpredictable. They will be made aware of the great advancement in the many biological fields but also increase their awareness about the many new discoveries are still to be made.

6. *Autonomy and professional capacity*

Students will gain qualities and transferable skills necessary for further study, employment, community involvement and other related activities. These include the exercise of initiative, personal responsibility, and accountability in individual and group contexts, as well as the ability to work ethically and effectively with others. Graduates of the program will bring current expertise and innovative, informed approaches to their important positions in the economy. Alumni will be qualified to excel in rewarding careers, such as teaching, technical and field work with industry and the public sector, scientific communications, commerce, industry research and postgraduate studies. Graduates will fulfill the entrance requirements for professional schools in the fields of teaching and health services. In addition, they will be able to:

- contribute as effective participants in multidisciplinary and multi-cultural teams, in both membership and leadership roles
- recognize and value the alternative outlooks that people from various social, ethnic and religious backgrounds may bring to scientific endeavors
- understand management and/or business practices relevant to employment situations, including the importance of quality management and quality performance

b. Admission requirements

The Biotechnology Technologist-Biological Sciences Bridge semester and Degree Completion pathway provides college graduates with the opportunity to apply their three-year Ontario college Biotechnology Technologist diploma towards completion of a UOIT Bachelor of Science (Honours) in Biological Sciences degree.

Graduates from any three-year Ontario college Biotechnology Technologist diploma program with a cumulative average of B or higher will be considered for admission to the UOIT Biological Science Bridge Program. The Bridge Program will position them for entrance into the two subsequent degree completion years, leading to completion of the UOIT Honours BSc in Biological Science degree program, Complementary Studies specialization.

The Bridge Program consists of the following two courses and a specialized course module:
:: BIOL 1020U Biology II (3 credits)
:: CHEM 1020U Chemistry II (3 credits)
:: BIOL 1011M Chromosomal and Molecular Basis of Inheritance (0 credits, pass/fail grading)
BIOL1020U and CHEM1020U are regularly offered during the spring/summer semester to current UOIT students. BIOL1011M would be available only for the Bridge Program students.

Students who successfully complete BIOL 1020U and CHEM 1020U with an overall B average and who successfully pass BIOL1011M will be eligible for admission to the Bachelor of Science (Honours) program in Biological Sciences at UOIT. They will be awarded 42 transfer credits from their college studies to apply towards the required 120 credits for the BSc (Honours) degree. BIOL1020U and CHEM1020U will account for 6 of the remaining 78 credits. Students successfully completing the Bridge Program may complete their degree requirements over a 5-semester period, including a 3-course spring/summer semester, by following the prescribed Program Map described later in this proposal.

The next section describes the details of the combined Bridge Semester and Degree Completion program that together comprise the pathway.

c. Program structure

Overview

The degree completion pathway follows the program requirements of the Biological Science – Complementary Studies specialization. The combined structure of the Bridge and Degree Completion program is outlined in the following:

First and second year Core Science Courses

Students will take nine courses (27 credits) in biology, chemistry, physics, mathematics, and scientific computing tools: BIOL 1020U, CHEM 1020U, PHYS1030U, PHYS 1040U, MATH 1000U, MATH 1020U, CSCI 1000U, CHEM 2020U and STAT 2020U. They will also take a specialized course module in Chromosomal and Molecular Basis of Inheritance (BIOL 1011M) as part of the Bridge Program. These courses provide a basic background in all the core areas of science.

Second, third and fourth year Biological Science Courses

Students will take six second, third and fourth year core biology courses (18 credits): BIOL 2010U, BIOL 2020U, BIOL 2030U, BIOL 3050U, BIOL 3080U and BIOL4080U. The students will also take BIOL 3020U, BIOL3031U, BIOL3650U, BIOL4030U, BIOL4040U and BIOL4050U (18 credits) in order to partially fulfill their senior Biology Electives requirement.

Electives

To complete the requirements of the degree, students take the following UOIT electives:

- One liberal studies elective (3 credits)
- Two third-year Biology electives (6 credits)
- Two general electives (6 credits)

Applied Learning Opportunities

As noted in the learning objectives above and consistent with UOIT's orientation, this program puts a high priority on practical application of academic knowledge. The third- and fourth-year courses offer students an opportunity to augment the knowledge acquired during their college program by taking multi-disciplinary first-year courses and Biology foundational courses in the second year of their degree completion program.

Calendar copy

Program Information: Bridge Program Degree Completion pathway to a Bachelor of Science (Honours) in Biological Science – Complementary Studies from a three-year Biotechnology Technologist College Diploma.

General Information. The pathway will allow students graduating with a three-year Biotechnology Technologist Diploma from any College in Ontario to complete a Bachelor of

Science (Honours) in Biological Science within two calendar years post diploma, consisting of a spring Bridge Semester, two fall-winter academic years, and an intervening 3-course spring/summer semester.

Careers. Students will gain competencies and transferable skills necessary for further study, employment, community involvement and other related activities. These include the exercise of initiative, personal responsibility, and accountability in individual and group contexts, as well as the ability to work ethically and effectively with others. Graduates of the program will bring current expertise and innovative, informed approaches to their important positions in the economy. Alumni will be qualified to excel in rewarding careers, such as teaching, technical and field work with industry and the public sector, scientific communications, commerce, industry research and postgraduate studies. Graduates will fulfill the entrance requirements for professional schools in the fields of teaching and health services.

Admission requirements. The Biological Sciences Degree Completion Pathway provides college graduates with the opportunity to apply their three-year Ontario Biotechnology Technologist college diploma toward a Bachelor of Science (Honours) in Biological Sciences.

Graduates from any three-year Ontario Biotechnology Technologist college diploma program with an overall B average or better, will be considered for admission to the UOIT Biological Sciences Bridge program. This consists of the following two courses and a pass/fail course module:
:: BIOL 1020U Biology II
:: CHEM 1020U Chemistry II
:: BIOL 1011M Chromosomal and Molecular basis of Inheritance (course module)
Students who successfully complete the bridge courses with a cumulative B average in BIOL 1020U and CHEM 1020U and pass BIOL1011M will be eligible for admission to the first year of the Degree Completion Pathway leading to a Bachelor of Science (Honours) in Biological Sciences from UOIT.

Degree Requirements. The requirements for the degree completion program are detailed in the following program map.

Program Map for Bridge Semester and Degree Completion Program for Ontario College Biotechnology Technology 3-Year Diploma Graduates

Fall		Winter	
Bridge Semester			
		BIOL 1020U	Biology II (Spring)
		CHEM 1020U	Chemistry II (Spring)
		BIOL 1011M	Chromosomal and Molecular basis of Inheritance (Spring)
		Elective***	(Spring or Summer)
Year 1			
BIOL 2010U	Introductory Physiology	BIOL 2020U	Genetics and Molecular Biology
BIOL 2030U	Cell Biology	PHYS 1010U	Physics I
CHEM 2020U	Introduction to Organic Chemistry	BIOL3650U	Fundamentals of Nutrition
MATH 1000U	Introductory Calculus	BIOL 3031U	Infection and immunity
CSCI 1000U	Scientific Computing Tools	Elective **	
Spring/Summer 1-2			
		PHYS 1020U	Physics II (Spring)
		MATH 1020U	Calculus II (Spring)
		Elective**	(Spring or Summer)
Year 2			
BIOL 3020U	Principles of Pharmacology and Toxicology	BIOL 4030U	Advanced Topics in Environmental Toxicology
BIOL 3050	Developmental Biology	BIOL 4080U	Bioethics
STAT 2020U	Statistics and Probability for Biosciences	BIOL 4050U	Advanced Topics in Pharmaceutical Biotechnology
BIOL 3080U	Biochemistry II	3rd yr Biol El. *	
BIOL 4040U	Applied Molecular Biology	3rd yr Biol El. *	

* 3rd yr Biol Electives: six credits, selected from BIOL 3040U, BIOL 3060 (BIOL 2050U required as pre-req), BIOL3620U

** Electives: three credits in Liberal Studies courses; six credits in General electives (these may be in either science or non-science subjects; these include the elective listed in the Bridge Semester).

*** This Elective course may be taken at any time during the program; its placement in the Bridge Semester is a suggestion, but students may defer it to another point in their program.

d. Program Content

The following table shows the courses, laboratories and tutorials taken by semester for the program. The italicized course module (BIOL1011M) is the only new course.

Bridge Semester and Degree Completion Pathway to a UOIT Honours BSc Biological Science Degree for 3-year Biotechnology Technologist Ontario college graduates			
L=Lab, T=Tutorial, B=Bi-weekly *Italicized* indicates new course, others are existing courses			
Course No.	Course Name	Lectures	Lab/Tutorial
Bridge			
BIOL 1020U	Biology II – Diversity of Life/Principles of Ecology	3	3LB, 1.5TB
CHEM 1020U	Chemistry II	3	3LB, 1.5TB
BIOL 1011M	*Chromosomal and Molecular basis of Inheritance*	*Online*	0
	Elective (recommended, but not required, to be taken in this semester)	3	
Year 1 – Fall semester			
BIOL 2030U	Cell Biology	3	3LB, 1.5TB
BIOL 2010U	Introductory Physiology	3	3LB,1.5TB
CHEM 2020U	Introduction to Organic Chemistry	3	4LB
CSCI 1000U	Scientific Computing Tools	3	1.5T
MATH 1000U	Introductory Calculus	3	2T
Year 1 – Winter semester			
BIOL 2020U	Genetics and Molecular Biology	3	3LB, 1.5TB
PHY 1010U	Physics I (or Physics 1030U, Introductory Physics)	3	3LB, 1.5TB
BIOL 3650U	Fundamentals of Nutrition	3	0
BIOL 3031U	Infection and Immunity	3	0
	Elective	3	
Spring/Summer 1-2			
PHY 1020U	Physics II	3	3LB, 1.5TB
MATH 1020U	Calculus II	3	1.5T
	Elective	3	
Year 2 – Fall semester			
BIOL 3020U	Principles of Pharmacology and Toxicology	3	0
STAT 2020U	Statistics and Probability for Biological Science	3	1.5T
BIOL 3050U	Developmental Biology	3	3L
BIOL 3080U	Biochemistry II	3	2T
BIOL 4040U	Applied Molecular Biology	3	0
Year 2 – Winter semester			
BIOL 4030U	Advanced Topics in Environmental Toxicology	3	0
BIOL 4080U	Bioethics	3	0
BIOL 4050U	Advanced Topics in Pharmaceutical Biotechnology	3	0
BIOL 3XXXU	3rd year elective	3	
BIOL 3XXXU	3rd year elective	3	

NEW COURSE TEMPLATE

Faculty: Science		
Course title: **Chromosomal and Molecular basis of Inheritance**		
Course number: *BIOL 1011M*	Cross-listings: None	_X_ Core ____ Elective
Credit weight: 0	Contact hours: Self-paced Online Material Lab 0 Tutorial 0 Other 0	

CALENDAR DESCRIPTION

This course module will be offered to graduates from a three-year Biotechnology Technologist Ontario College Diploma program who have been accepted into the Bridge Semester leading to the Degree Completion pathway to a BSc (Honours) in Biological Science, Complementary Studies specialization. The module will cover topics on inheritance that are absent from the learning outcomes of the Biotechnology Technologist Diploma program. The module will begin with a review of mitosis and meiosis and will be followed by study of the principles of Mendelian genetics, the analysis of more complex inheritance patterns including sex-linked inheritance, genetic recombination and linkages, and analysis of human pedigree and genetic disorders.

Prerequisites	Enrolment in the Biotechnology Technologist-UOIT Biological Science Bridge program
Co-requisites	None
Credit restrictions	BIOL 1010U
Credit exemptions	None

LEARNING OUTCOMES

At the end of the course, the student will:

- Understand key principles of Mendelian genetics
- Be able to solve genetics problems using the basic rules of probability
- Understand how the behavior of chromosomes during meiosis and the location of the genes on a chromosome provide a basis for observed inheritance patterns
- Understand the genetic basis of various human disorders

DELIVERY MODE

Lecture material in online format, equivalent to about 9 hours of regular lectures

TEACHING AND ASSESSMENT METHODS

- a final examination
- the course will be graded on a pass/fail basis

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

N/A

RESOURCE REQUIREMENTS

a. Faculty members

Core faculty. All the full time courses in the program are currently offered by the Faculty of Science; therefore there will not be a requirement for any new core faculty.

b. Additional academic and non-academic human resources

Marginal increases in various areas would be required to accommodate the increased enrolments; mainly in labs and tutorials.

One-time resources are required to create an online version of the course module BIOL 1011M (Chromosomal and Molecular basis of Inheritance).

Ongoing financial resources are required to deliver the online module BIOL 1011M in the spring semester of the bridge program.

c. Physical resource requirements

The online components of all courses will require marginal additional IT support.

Space and consumable requirements for courses taking place in classrooms and laboratories will be depend on the numbers of students registered in the courses.

Business Model for Biotechnology Technologist Diploma - UOIT Honours Biology-Complementary Studies Bridge and Degree Completion (BIU=2 in all semesters)

BIU	**5440**
Formula Fee	**2386**
Net Grant (2*BIU-FF)	**8494**

Annual Tuition	**5440**		Year				Steady state
			2012-13	2013-14	2014-15	2015-16	2016-17
Enrolment Projections (Bold represents Input Parameter)							
Flow-through Factors							
Bridge Semester-Year 1	**0.80**	Bridge Semester	**10**	**20**	**30**	**30**	**30**
Year 1-2	**0.90**	Year 1	0	8	16	24	24
		Spring/summer+Year 2	0	0	7	14	22
Total			10	28	53	68	76
Revenue			$ 41,802	$ 195,076	$ 475,149	$ 713,421	$ 858,334
Expenditures							
FT Faculty Teaching Requirements	**#**						
Bridge Semester Shared Science	2		$ 3,555	$ 7,110	$ 10,665	$ 10,665	$ 10,665
Bridge Semester Program	1		$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
Bridge Semester Electives	1		$ 1,778	$ 3,555	$ 5,333	$ 5,333	$ 5,333
Year 1 Shared Science	9		$ -	$ 15,358	$ 30,715	$ 46,073	$ 46,073
Year 1 Electives	1		$ -	$ 1,706	$ 3,413	$ 5,119	$ 5,119
Spring/summer Year 1-2 Shared Science	2		$ -	$ 3,413	$ 6,826	$ 10,238	$ 10,238
Spring/summer Year 1-2 Electives	1		$ -	$ 1,706	$ 3,413	$ 5,119	$ 5,119
Year 2 Shared Science	8		$ -	$ -	$ 19,908	$ 39,816	$ 62,568
Year 2 Electives	2		$ -	$ 5,688	$ 11,376	$ 17,064	$ 17,064
Sub-Total			$ 6,833	$ 40,036	$ 93,148	$ 140,927	$ 163,679
TA and Consumables Costs							
Bridge Semester courses with labs	2		$ 2,516	$ 5,033	$ 7,549	$ 7,549	$ 7,549
Bridge Semester courses with tutorials	2		$ 1,511	$ 3,022	$ 4,533	$ 4,533	$ 4,533
Bridge Semester courses (lecture only, grading costs)	1		$ 486	$ 971	$ 1,457	$ 1,457	$ 1,457
Year 1 courses with labs	5		$ -	$ 4,733	$ 9,465	$ 14,198	$ 14,198
Year 1 courses with tutorials	6		$ -	$ 3,626	$ 7,252	$ 10,878	$ 10,878
Year 1 courses (lecture only, grading costs)	1		$ -	$ 389	$ 777	$ 1,166	$ 1,166
Year 1-2 Spring/summer courses with labs	2		$ -	$ -	$ 1,761	$ 3,523	$ 5,536
Year 1-2 Spring/summer courses with tutorials	2		$ -	$ -	$ 1,058	$ 2,115	$ 3,324
Year 1-2 Spring/summer courses (lecture only, grading costs)	0		$ -	$ -	$ -	$ -	$ -
Year 2 courses with labs	1		$ -	$ -	$ 968	$ 1,936	$ 3,043
Year 2 courses with tutorials	2		$ -	$ -	$ 1,058	$ 2,115	$ 3,324
Year 2 courses (lecture only, grading costs)	7		$ -	$ -	$ 2,380	$ 4,759	$ 7,479
Sub-Total			$ 4,513	$ 17,772	$ 38,256	$ 54,228	$ 62,484
Total			$ 11,345	$ 57,809	$ 131,404	$ 195,155	$ 226,163
Gross Profit			$ 30,457	$ 137,267	$ 343,745	$ 518,266	$ 632,171
Expenditures as % of Revenues			27.1%	29.6%	27.7%	27.4%	26.3%

Assumptions:

One student = 1 FFTE
No inflation factor is used
Average salary for FT faculty member is $90,000 plus 18.5% benefits

TA cost/hour (with 11% benefits)	**38.85**
Lab section size	**24**
Lab consumables cost/student/course	**25**
Tutorial section size	**36**
Average TA contact hours/lab section	**70**
Average TA contact hours/tutorial section	**70**
Average hrs/student grading (no tut or lab)	**1.25**
BIOL1011 module stipend	**1500**

Shared courses fit into existing sections of size N; ascribe enrolment/N cost to courses (assume others will take as electives)

Shared courses fit into existing sections of size N for	Bridge	**150**
Shared courses fit into existing sections of size N for	Year 1	**125**
Shared courses fit into existing sections of size N for	Year 2	**75**